IXI

Watson

Yours truly,

C. B. Watson

PREHISTORIC SISKIYOU ISLAND

AND

MARBLE HALLS OF OREGON

BY

C. B. WATSON

To my daughter, Lilian, and son, Chandler W., I dedicate this little book.

I have observed with pleasure the interest that each of you take in the study of nature and have felt that my own observations of the country where you were born and with which you have, in a measure, become familiar, might not be a matter of indifference to you.

I therefore present it as a token of my love and esteem and as evidence of my approval of the manner in which each of you are grappling with the problems of life. I am sure that close observation of the material world about you and an application of the lessons you will learn there will be of great assistance to you.

Affectionately your father,

C. B. WATSON.

TO THE READER:

I do not present the following pages as, in any sense a scientific discussion of the subjects treated, but as the result of many years of study in which I have taken great pleasure. The country is new and the strenuous business of life does not allow every one to become familiar with all the features of moment that pertain even to a circumscribed area about him. Yet there are very few people who are not called upon often by friends at a distance for information such as I believe this little volume contains and who, without some source to draw from would not be able to give it.

The work is in no sense fiction as its title might imply to some. The country described was at one time an island. A few of the first chapters may seem to some readers as prolix and unnecessarily detailed in the facts presented to prove the hypothesis. I am sure, however, that a close reading of these will render the remainder of the work more interesting and intelligible. It is a study of nature in some of her most interesting and valuable features. The soil and climate of any country is a matter of first concern to its residents and to prospective inhabitants. It is not less important to know the whys and wherefores, and these I have attempted to suggest.

Nature study is receiving more and more attention as we progress along the line of advancing civilization and I profess nothing more than a desire to enlist a closer observation and study of it in some essentials that I believe are neglected.

Ashland, Oregon, January A. D., 1909.

C. B. WATSON.

INDEX.

The Snow Bank.

The wind that whistled o'er the ridge
And gently dropped its soft, white load,
'Till each rill had a crystal bridge
And neither peak nor canyon showed,
Has passed. 'Tis August's clear, hot day;
The red sun tells of fall's advance,
And every blighting, scorching ray
Plays tunes that make the hot air dance.

The peaks are bare, but on each slope,
Close nestled in the shade below,
A thirsty country's only hope
And parching drought's one deadly foe,
With surface calm and cold and white
And yet a world of power within,
Lies one vast mass of living light;
Some mighty river's origin.

Rare, dainty trees stand grouped around
A thousand tiny water-falls.
Moss rimmed, fern draped, half under ground
Far down the slope a brooklet brawls.
A tree-fringed park, a grassy glade,
Deep wooded canyons far below;
In such a setting Nature laid
This priceless gem, this bank of snow.

C. W. W.

Prehistoric Siskiyou Island and Marble Halls of Oregon.

Chapter I.

THE PIONEER.

"Nature will be reported. All things are engaged in writing their history. The plant, the pebble, goes attended by its shadow. The rolling rock leaves its scratches on the mountain, the river its channel in the soil; the animal its bones in the stratum; the fern and leaf their modest epitaph in the coal. The falling drop makes its sculpture in the sand or stone. Not a foot steps in the snow, or along the ground, but prints characters more or less lasting, a map of its march. Every act of the man inscribes itself in the memories of his fellows, and in his own manners and face. The air is full of sounds; the sky of tokens; the ground is all memoranda and signatures, and every object covered over with hints, which speak to the intelligent."—(Emerson).

Nature is everywhere striving to be understood. For ages upon ages it has been writing its messages, and working to accomplish a conscious being that could read them. Primeval man took up the task as necessity compelled him. Hunger sent him to the chase, which was his first enterprise. His wants were the sole stimulants, which by degrees aroused sluggish thought to action and gave birth to invention. Accident brought forth discoveries, which in turn were utilized. Each acquisition thus gained, increased, strengthened and extended his faculties. The conscious man was developing. His knowledge has been gained by a kindergarten process. If we look about us we wonder at the colossal strides intelligence has taken; but if we look back down the ages and mark the lapse of time since man first appeared and the slow advance he has made, we find that the evolution of conscious intelligence has only kept pace with the evolution of organic matter.

We boast of the progressiveness of this age and the mastery we have gained over the forces of nature. The ocean has been subdued, in a way, and has been appropriated as the highway of nations. Electricity and steam have been harnessed and made to bear burdens and messages and to light the footsteps of further conscious progress. From groping after snails and bugs, in search of food, and climbing trees to avoid more ferocious animals than himself, man is now engaged in missions of mercy and scanning the heavens with his telescope in his efforts to fathom the mystery of the universe. He looks within and thinks he recognizes a dual quality in himself, and constructs philosophies to account for his being; the whence and whither, from which and to which his destiny is leading him. Charged with a nervous impulse he braves arctic regions and dark continents and ferrets out new secrets, which, when reported, arouse his fellows to further conquest.

New countries peopled with savage men are sought and subdued to the progressive characteristics of the age, and the fittest survive. And yet the pioneer into such regions seems not to have been conscious of the fact that he was but a messenger of that mysterious spirit of progress which moves so strangely in and about him. The spirit of adventure is but nature's leading string for development, and whether it led into untamed wilds or the marts of commerce,

"He trudged along, unknowing what he sought,
And whistled as he went, for want of thought."

"Westward the star of empire" led the pioneer across the continent to the Pacific coast but yesterday, lured by the promises and promptings of nature. Here she was to open up one of her richest store houses, and in some mysterious way he was to reap such plethora of wealth as is promised at Oriental fairs. He braved mountains and deserts and was ever on the watch for the savage that haunted his way, lighted ever by the pillar of cloud and fire that burned in his veins the command "Onward," to the verge of the continent and Pacific's surf, where he planted the flag and pronounced the sacred word "Home."

"God moves in a mysterious way
His wonders to perform,
He plants his footsteps on the sea
And rides upon the storm."

One can not well avoid the thought that the time for spreading a higher intelligence had come and these con-

scious beings, though unconscious of the purpose, moved by the spirit of the times, were allured to a destiny that has marked an epoch in the world. These mountains and valleys were ripe for exploitation, and the inhabitants were unsuited for the purpose. These pioneers, travel-stained and weary, viewed the land of promise from the mountain tops with mingled feelings of hope and despair. These valleys were fair to look upon, but the full value of the land had not been told to them. It is but little more than half a century since the first of these adventurers looked upon the Rogue River valley from the high summits of the Cascade mountains, and watched the spots of sunshine and shadow playing hide and seek among the forest clad eminences that afforded a border and decorated frame work about a beautiful picture. The diversified wealth of the land was unknown to them, and immediate, pressing demands permitted no time to be devoted to cataloguing the resources of their new home. Indians, sometimes friendly and sometimes hostile, surrounded them and "eternal vigilance was the price" they were required to pay for the privilege of occupying the land they had chosen.

We can easily picture the eagerness with which these adventurers selected their claims and began the operations of home-building. Still they were unconscious of the important part they were playing in the drama of laying the foundation for so important an extension of conscious intelligence. Here was laid the corner stone by them, for a republic of intelligent growth in all that goes to make up progressive activity. The country was new to them and unknown to the mass of mankind. Since that time the expansive energy of intellect, well directed, has wrung from the wilderness a valuable possession; has added to the wealth of the world untold millions, and aided in deciphering many of nature's records that were never before read. Here has been developed a land more varied in its resources than almost any other. Every year has added to the knowledge of its people something new in the value of their acquisition. It is not strange that so vigorous a commonwealth should have been built on so excellent a foundation. These pioneers may well have been considered sturdy yeomen. None but the brave and energetic would have undertaken so arduous a task, and such ancestry was bound to furnish a worthy posterity. Fifty years is a short time to make such changes in. But that conscious intelligence all over the world was beginning to read the messages that nature had been writing from the

beginning, and had begun to look for them in the sands of the seashore, the rocks of the mountain side, along the rivulets and rivers, in the forests and the prairies. The mines attracted thousands and the gold enriched many. Hamlets grew to be towns and the towns to be cities. Every indentation of the coast where vessels could safely anchor became a port where cargo was discharged for the interior and pack trails were built to connect them with the valleys and the mines in the mountains. Such activity soon put a quietus upon depredations by the Indians. Though the Pioneer Associations are suffering a rapid depletion, yet each annual reunion sees a goodly number of the heroes and heroines of those early days gathered for social banquet and to rehearse their experiences. Indian fights, bear hunts, gold excitements and a review of their trials in crossing the plains became the order of the day, the whole rounded off with resolutions, reading memorials, speech-making and a rich banquet of good things. Now the mountain streams furnish the power and the valleys are lighted with electricity. In the more thickly settled portions many homes are illuminated by turning on the current; neighbors visit by telephone; the arrival of the mails is calculated to the minute, for railroads followed where the pioneer blazed the way. In the section which will be treated of in this little volume, thousands of acres of apples, peaches, pears, apricots, prunes, cherries, grapes and berries, furnish their products to all the great markets of the country and are even carried to foreign parts. The label "Rogue river," is sufficient to pass the pack without question and at the highest price. The magnificence of Oregon's forests has set the lumbering world crazy and the courts are trying to straighten out the muddle resulting from the excellence and abundance of her products.

Perpetual snow in the higher mountains contrasts with grass perpetually green in the valleys, each in sight of the other. As we proceed in subsequent chapters the variety and quality of the resources of "Prehistoric Siskiyou Island" will be made apparent. The reasons for much that he enjoys, the pioneer has not yet learned, and I shall endeavor to tell some of it to him. The past fifty years have been fast and furious and but little time has been given to the average citizen to learn the whys and wherefores of things that require a little scientific investigation.

In the matter of climate and soil the country to be treated is almost unique. The climate is not exactly like any other on the coast, and for reasons easily made appar-

ent. The soils are equally rare and as easily explained, and the mineral wealth is more varied than in any other region of which I have information. The scenic attractions and healthgiving conditions are not excelled. How fortunate then, were the early settlers in choosing this favored region. Accident and energy, impelled by that spirit that is mysteriously moving the world, are responsible for their good fortune.

It seems that each epoch has had its rise because of some frenzy that like a malady settled upon its chief actors. Immediately preceding the discovery of America, the wealth of the Indies aroused the cupidity of maritime nations and Columbus in seeking a more direct route to that Golconda, sailed west and discovered America. The wealth of the new world aroused greater frenzy in the greed for gold, and buccaneering, robbery and wholesale murder followed. This again was followed by the frenzy of conquest and pillage in which Spain and Portugal sowed the seeds of their own ruin, because they took no thought of the future, nor recognized either the principles of judicious commercialism nor human rights. Great Britain, with no less of avarice, but with more craftiness and foresight, saved the goose but stole the eggs. The coming of the pilgrims to Plymouth was the result of a religious frenzy and persecution, which was practiced even by the devotees that fled from it. The spirit of conquest has ever been irresistible where the stake seemed worth the candle and is heightened by the spirit of adventure for its own sake. It seems to be a human principle but seldom practiced humanely. The Pilgrims fleeing from persecution, seemed to be only the swampers for a great army of adventurers that followed and overran the American continent. Here, upon the wreck and ruin of many nations that fell before them, they established the Great Republic that has gained the distinction of leading the world on a high moral plane in its governmental policies. In the apparent pursuit of a destined purpose, "Westward the star of Empire took its way," only to be temporarily stopped by the shores of the Pacific. With irresistible force, this conscious intelligence has broken down every barrier and overrode every obstacle, alternately dealing in mercy and crime, with prayers and curses, now helping the needy and anon murdering the friendless, but withal, climbing higher in the scale of progress. The fields of conquest by superior people over inferior ones, seems almost exhausted on the old lines, but new ones are being found.

The frenzy of today is to be seen in the exercise of the spirit of commercialism along ever-varying lines. The records and messages Nature has written are being read, and through the knowledge gained her laws are being better understood and applied. She is giving up her secrets and crafty commercialism is making monopolies of them to gratify that same greed for gain that in the past has fostered conquest, pillage and murder. The commercial buccaneers of today, like those of Spain and Portugal, are sowing the seeds of their own destruction. Gambling and speculation are the order of the day. The great cities with their sky-scrapers and vice, allure the adventurers as the candle does the moth, and with the same result. Legitimate exploitation of the soil is largely neglected and victims to ruthless greed fall before the moving army of vandals as in the days of the Incas and Aztecs. The wealth of the land is drawn to the great cities and much of the best blood of the country is drawn after it, allured by the glitter. The frenzy is fast and furious and the corresponding development of the soil and the building up of country homes are neglected, though garden spots lie untouched, waiting for the malady to pass and the homeseekers to return. The rumblings are heard all over the land like earth tremors that precede the shock; and the shocks are not altogether lacking. Little more than a year ago the country was in the throes of one that came as mysteriously and unheralded as did the destruction of San Francisco.

I was at Portland at the time, and what I saw there was a mild attack as compared with that in other commercial centers. Commercial Clubs, Boards of Trade, Chambers of Commerce and the newspapers were sending to the world daily statistics of unprecedented growth and prosperity. Strangers thronged the streets and the city was a moving picture show in perpetual performance. Men and women streamed in and out of the banks and spent their money like patriots shedding their blood in war times. The hilarious dance was like that at Belgium's capitol just preceding the battle at Waterloo. Then came a proclamation from the Governor and the banks closed with a "dull sickly thud." People looked at each other in startled astonishment and tried to read the riddle in each other's faces. Men with deposits were refused at the banks that held their money. The brakes were set so hard that the wheels of trade were flattened by the sudden slide over unyielding rails. Contracts made and not begun, were

cancelled, and contractors in the midst of their work were brought face to face with ruin. Workmen, who the day before went whistling to their tasks with well filled pails, stood on the street corners stunned and despondent. The newspapers continued to scout the notion that there was any serious danger, and assured all that the sudden congestion would yield in a few days. Weeks rolled on and the holiday proclamation was renewed from day to day. The doors of the courts were closed and the wheels of Justice were stopped. Lawyers discussed the situation in the corridors of the hotels and on the streets and sighed for the fees that were almost at hand when the bolt fell. Men languished in jail and no order could be made to determine their fate. Bargain counters ceased to be alluring and lunch counters increased their business. From every part of the country came the same sound, the dull grinding of machinery, yet in languid motion, but from which most of the power had been withdrawn. In a little while the crash of breaking banks was heard over the land and a feeling of impending calamity commenced like the silent warnings of a storm at midnight. Here was a financial panic at a time of the greatest prosperity.

If the misused capital had been invested in the legitimate exploitation and development of such regions as I shall describe in the following pages such a panic would not have occurred. If the thousands thrown out of employment had been more generally engaged in the improvement of eligible locations in this broad land that are still unappropriated, the cities where these men were congregated would not have been discussing the problem of feeding the unemployed; so much crime would not be reported in every daily paper. Many of the present idle men in Oregon could yet find eligible, unoccupied spots in the "prehistoric island" which I shall describe in this book. The booming of the cities, it seems to me, is out of proportion to the attention given to the rural districts, upon the development of which the cities must depend. The country must bear the expense and should be fostered by every enterprise dependent on it. Instead of fostering and stimulating further development of this new and wonderful land, greedy commercialism but emulates the greed of the buccaneers of old, laying a heavy hand upon it and making it to groan under unjust tribute.

The mountains and valleys of which I shall speak possess the resources of a veritable kingdom of wealth, but it needs capital for development. Railroads and trolley

lines are needed and would be made to pay in the development of a country so rich in material resources, and to accommodate the tourists and sight-seers who would flock hither. The section to which I shall direct attention contains about ten thousand square miles of territory and about forty thousand people. It would easily support a quarter of a million and add hundreds of millions of dollars to the wealth of the state. Go with me and I will show it to you, and that we may the better understand it we will try to read the records that Nature has written and from which we shall learn the secrets of its climate and soil; its mineral, the wonders of its forests, gardens, orchards and fields, and by no means the least will be its wonderful scenic beauty.

Chapter II.

PREHISTORIC SISKIYOU ISLAND.

"Come forth into the light of things;
Let nature be your teacher."

The late Dr. Condon, Professor of Geology at the University of Oregon, in his charming little book entitled "The Two Islands," has outlined in a very interesting way, the physical growth of the state, using the two islands as a nucleus from which that growth proceeded. He has carried us to the various lake and sea beaches and presented the records of the history of that growth through the fossils from cretaceous times down to the present. He tells us that in the cretaceous era there was a great island occupying the southwestern part of Oregon and northwestern part of California, to which he has given the name "Siskiyou Island," and another occupying the northeastern portion of the state which he has designated as "Shoshone Island." The U. S. Geological Department has recorded this "Siskiyou Island" as a cretaceous body and named it "The Klamath Group" of mountains. The geological records contained in the rocks and fossils show that there was a time when it was probable that no land existed above the waters of the ocean, eastward of this island nearer than the foot of the Rocky mountains. To the northeast three hundred mils away, Shoshone Island was an isolated fragment of land surrounded by a watery waste and to the southeast rose the "High Sierras" overlooking a sea to the east and west.

Perhaps the best possible way to attract public attention to such a subject, in this highly commercial age, is to see it from a utilitarian point of view. For instance, the three great seagirt regions named, have been the scenes of the most active and profitable mining in California and Oregon. One having made this observation, if interested either in the study of geology or mining, would naturally seek for some corresponding features in these three sections. First, he would perhaps notice that granite enters largely into the structure of each, and that each is surrounded by formations entirely different. The Blue mountains (Shoshone Island), are surrounded by the Great Basin, which also lies to the east of the other two. Lapping up against the edges of each of these groups of mountains, lie stratified formations consisting of gravels, shale, sandstone,

etc. It would be observed also that in many places these beds are auriferous, i.e. gold bearing. The character of the gravels resting against the base of these old islands also shows their sources to be the higher mountains at the base of which they lie. The lapping of the sandstone shows that its bedding was covered with water at the time the sand was deposited, and the marine shells which are the fossils contained in the sandstone, show the water to have been the ocean, or an arm of it. The gravel and conglomerate upon which the sandstone rests consists of rounded pebbles, which by their own form suggest that they were made so by stream action as distinguished from beach action. The beds contain water worn fragments of granite and other rocks peculiar to the portion of the mountain from which they came. If these beds contain granite, and no granite can be found except in the direction of the higher mountains, we would naturally look in that direction for our granite formation. If the gravel also contains gold mixed with the granite, we would for the same reason seek its source in the same direction. It is a pretty well established fact that broken and eroded gold-bearing quartz ledges constitute the sources from which gold placers have been fed. We therefore trace the indications from an auriferous gravel deposit toward its source in the gold-bearing quartz. These observations will apply equally to each of the groups of mountain islands mentioned. These are some of the practical things that attract most men, who without knowing it, are studying geology. These three sections are so much alike in many essential particulars that men have been led into a study of the phenomena of nature and have not only found the study a seductive pastime, but a gateway to that wider knowledge of things that has changed the whole trend of life and out of adventurers have made philosophers and of paupers have made men of wealth. But we are engaged to study nature at first hand and not to indulge too largely in philosophy.

Without too much of detail it will be sufficient to suggest that geologists who have made the subject a deep study, who have traced shore-lines and studied the fossils and stratified formations, have verified the fact that the Blue mountains and the Klamath group (i.e. "Siskiyou Island"), were islands and the High Sierras a continent, or a larger island, at a period in the distant past when the waves of the ocean rolled over the spot where Shasta now stands, and washed the foot of the Rocky mountains. What is known as the "High Sierras", has its northern limit between

Feather river and Pitt river, leaving a broad expanse of water between the Sierras and Scotts mountains, which constitute a part of the Klamath group. This stretch of water is designated by Professor J. S. Diller of the U. S. Geological Service, as Lasson straits and furnished an outlet for the great inland sea that was then being made by the gradual emergence of the Cascade mountains above the surface of the ocean. A careful study of the country, its formation and shore-lines, has enabled the departments of geology of the United States and California, to give us a reasonable idea of the time when the Wooly Bully mountains, Scotts mountains, the Siskiyous and Rogue River mountains constituted an island in the upper cretaceous period.

The term cretaceous means chalky, from creta, "chalk" and refers to that period when the great chalk and limestone beds of Europe were being formed at the bottom of the ocean. The tribolite, trigonia and amonite, are forms of shell fish that lived in the ocean of that period, but are now extinct. The shells of these forms are found plentifully as fossils along the shore line of the old Siskiyou island and in the chalk beds of Europe. This tells us that here was a great mountain island before a considerable part of Europe was above the sea. Its southern shore-line was near the northern boundary of the present Sacramento valley. Yreka stands at its eastern shoreline, Ashland and Jacksonville in Oregon on its northeastern shore. Its course carries it across the Siskiyou mountains near where the Southern Pacific railroad crosses. Thence its course is irregularly toward the northwest until it reaches the coast north of Coos bay in Oregon. Its southern shoreline from the north end of the Sacramento valley is also irregularly toward the northwest until it reaches the ocean south of the mouth of the Klamath river. This old shoreline can be easily traced along considerable portions of its length, but is most distinct from near the headwaters of the Sacramento river northwardly to Rogue river in Oregon. Throughout this stretch the line is quite plain and easily traced. At the time when the ocean washed a pebbly beach along the shores of this prehistoric island, Ashland butte and other high peaks of the Siskiyous reared their smoking heads high into the air and their flaming summits lit up a broad expanse of shipless sea on either side of them.

In those primeval days, the leviathan of the deep long since extinct, played in sportive mood where now are beautiful valleys with fields, orchards, cities and towns. The

miner now toiling with pick and shovel uncovers the remains of mastodon and mammoth without a thought of the story they tell. He breaks up great slabs of sandstone rich in the fossil shells of species now extinct, without a thought of the information they afford. Shasta valley was then a bay, where, if vessels had existed, safe anchorage could have been found in a splendid land-locked harbor where the city of Yreka now stands. Ashland, a beautiful city of schools, colleges and churches, with a population of more than five thousand people, stands directly on the shoreline, and every sandstone foundation in it bears the shells of animals that lived in the sea in that far off period long before man came to inhabit the earth. Jacksonville, like Yreka, occupies the site of a land-locked harbor in the old island. The mining fields of northern California and southern Oregon lie within its limits. From Redding in California to Coos bay in Oregon, miners have toiled and sweated in search of the yellow metal, and millions of dollars have yielded them reward around the shores and in the interior of this prehistoric home of myriads of animals now extinct. Geologically no country offers more inducement to the student; none is richer in the history it furnishes, nor in the value of this history to the miner, orchardist and farmer. Shasta valley is covered with numerous hummocks, which on examination prove to be extinct volcanos. Mt. Shasta is king of the group, and in the upheaval of the Cascade range, it performed a very important part. This old island is seamed and scarred in many places with evidence of early volcanic action, and has been broken and scratched by glaciers. The seas that washed it received the deposits brought down by streams and other agencies for long ages. The earlier of these deposits were covered with sand that now constitutes the sandstone lappings and cliffs to be found along its old shoreline. On top of these deposits of sandstone at Yreka, Cottonwood, near Ashland, at Jacksonville, Willow Springs and many other places, rich placer gold mines have been worked with profit for more than fifty years. In each of these places it has been discovered from time to time, that underneath the sandstone there are beds of gravel bearing gold and corresponding in richness with the placers directly above and sometimes richer. In every instance it has been found that these sub-deposits correspond in character with those on the surface, carrying granite, quartz, porphyry, etc. The formations from whence these old gravels have come are only found in the high mountains in the interior of this old island.

It follows that the source of the deposits on the top and underneath the sandstone is the same, and only to be found on the landside of the old shoreline. As we leave the shore and proceed away from the island and climb the opposite slope we find stratum after stratum, one above the other, consisting of gravel, shale, clay, great beds of conglomerate, then heavy coarse sandstone, with more shale and clay following and the whole capped with basaltic lava from the volcanic outbursts of the Cascade mountains. This is especially true from the southeastern part of the Shasta valley in California, to near Grants Pass in Oregon and is easily traced.

At Yreka, Cottowood, the summit of the Siskiyou mountains where the Southern Pacific railroad crosses, and at Ashland, Jacksonville and Willow Springs we find the sandstone lapping up on the mountain of granite, with gold deposits both on top and underneath it imbedded in the gravels that have come from the old mountain. Near the foot of the old island and between it and the Cascades, lie Shasta valley in California and Rogue River valley in Oregon. These valleys border upon the old island and at one time seem to have constituted a shore margin of greater or less extent upon which was grown vegetation, in places sufficient to form considerable beds of coal. The edges of the valleys next to the shoreline, have been productive of gold placers, in places very rich, while the opposite sides away from the Siskiyous have produced practically none. The great mass of the Siskiyous as they now appear, is of granite, while the Cascades and its spurs are of sedimentary formation capped with basaltic lava. The lower parts of these valleys were originally covered with the same sediments, but have suffered great erosion and in many places the complete loss of sandstone covering, leaving only a feather edge resting against the Siskiyous. Since the expulsion of the sea and the elevation of the Cascades, the erosion of the mountains on both sides of the valleys have furnished a rich sediment coming from the mixed detritus of all ages represented in the wearing away of the shales, clays, conglomerates and basalt upon the one side, and the granite, quartz, porphyry, clay and lime from the other. These sediments mixed as they have been, in Rogue River valley, give to it a varied character of soil almost unique. This feature will be elaborated further on.

In places where erosion has worn away the basaltic covering in the Cascades there have been discovered some promising gold deposits in a formation similar to that of

Nevada and the Great Basin. This seems to indicate that the Cascades have arisen through a floor of formation similar to that found east of that range. Such gold deposits have been found far up Rogue river in quartz formation similar to that at Gold Field. This however gives no promise of paying placers.

Chapter III.

FURTHER EXAMINATION OF THE BORDERS OF THE ISLAND.

"Tax not my sloth that I
Fold my arms beside the brook;
Each cloud that floated in the sky
Writes a letter in my book."

The Siskiyou mountains are of great scenic attraction on the line of the Southern Pacific road, and to tourists prove very interesting. From its crossing of the Klamath river in California to the top of these mountains, thence down the northern slope to Ashland in Oregon, it follows near and crosses many times the old shoreline of the island. From the Klamath river its course is up Cottonwood creek, and by a very sinuous roadbed reaches the summit after a climb of more than a thousand feet. The distance from the Klamath river to the summit is about fourteen miles by the wagon road, but much more by the railroad. The Siskiyou mountains lie to the west of the road and are massive and heavily timbered, while to the east are the foothills of the Cascades with but little timber and that of a stunted growth near the road. The road bed for the first ten miles is chiefly over sandstone and gravel with an occasional basaltic ridge to cut through. To the east the hills are grass covered but having little surface water become brown and sere early in the season. To the west vegetation is more prolific and the indications of water are fully verified on examination. The Cottonwood receives all its tributaries (except wet weather streams) from the Siskiyou mountains, all of which have been prospected and yield gold, being very rich in places. This stream has been mined almost from its source to its mouth and has furnished California with one of its richest gold bearing regions. Above the mouth of the Cottonwood, the Klamath has produced no gold, while below it has been mined to the ocean and is still one of California's richest streams. All of its gold comes from the Siskiyous. The gravels along the foot of the Cascade mountains, so far as prospected are barren of that metal in paying quantities, while at the foot of the Siskiyous both on top and under the sandstone, in many places rich placer mines have been worked and are still being operated with profit. From these observations one would naturally con-

clude that the Cascade range opposite the Siskiyous is not a profitable section for the prospector, and that the latter constitute the source of supply for the great mining region of southwestern Oregon and all of that part of California tributary to the Klamath river after it has passed into the old island. One cannot observe that fact without concluding that the newer formation that makes up the Cascade range is very different from the old island, in ways not apparent on the surface, though that is sufficiently dissimilar to cause remark by the most casual observer.

The bed of the railroad at the summit crossing is over four thousand one hundred feet above the sea, yet the tunnel is largely in sedimentary matter, and about a half mile away and at an altitude of about four thousand feet the old sandstone crops out and is very rich in trilobite, trigonia, amonite and other marine shells belonging to the cretaceous period and proves that again we have our shoreline. To the southeast of this point and near the summit of the mountain, coal of a good quality is found and several tunnels have been run into it two or three hundred feet. This coal vein dips heavily into the mountain to the east and could only be drained by pumping, hence was abandoned. This is the exact point where the Cascades rising from the ocean, impinged upon the Siskiyous and lifted the shoreline to the elevation above noted. It also tells an eloquent story of a sea margin heavily timbered, having once existed there. Four miles further to the southeast, on the very summit of one of the high spurs of the Cascades, stands Pilot Rock, rising in massive grandeur almost vertical, over six hundred feet above the mountain that forms its base. This is a mass of columnar basalt, and probably was the scene of volcanic action near the close of the period when the shoreline was being lifted to its present position. In fact the railroad crosses at the exact spot where the Cascades and Siskiyous form their junction. From this point, which is Siskiyou station, the tourist on his initial trip north, gets his first impressive view of the Cascade range. Further on will be found a chapter devtoed to some of the scenic attractions in the high mountains of the old island, from the lofty summits of which, the Cascades will be viewed towering in places into the regions of perpetual snow. From this point to Ashland, a distance of about sixteen miles, we descend two thousand feet, and in our zig zag course cross the old shoreline, sometimes in the granite and again running through deep cuts in the sandstone. The road-bed is a wonderful piece of engineering and in its

cuts and tunnels furnishes a good opportunity for studying the formation of the old shore. In his trip down the Siskiyous to Ashland in Oregon, the traveler gets his first view of the state and his first sight of the famous Rogue river valley. There are very few views on the continent that so charm the visitor with their beauty and impress him with grandeur at the same time as this descent of 2000 feet. Before taking his farewell view of California and entering the tunnel one mile south of the Siskiyou station, he has noted the shining summit of Shasta towering over fourteen thousand feet into the blue vault, and with a sweep of vision has marked the lofty summits of Scotts mountains, a part of the old island, serrated and glistening with snow. Mountain billows are spread before him and valleys below him. This summit seems more than a topographic marking between two states; it is the line separating two climates as well; aye! more than that: it is the line separating two great epochs in the history of the physical growth of a continent. Pilot Rock rises just to the east; the chimney that gave vent to the fumes and flows from Vulcan's workshop far down in the bowels of the earth where were organized the last efforts of nature to expand the American continent. In the political history of the country that for the past few pigmy years men have been making we have heard much of expansion. How do such efforts compare with those of nature that have added hundreds of thousands of square miles of solid land to a continent that was before under the ocean? Taking our last view of California, we plunge into a tunnel almost a mile in length and emerge at Siskiyou station four thousand one hundred and twenty-five feet above the sea. No longer is California, Mt. Shasta and Scotts mountains in sight. With our faces to the north we turn to the right and are looking upon the solid phalanx of the great Cascade range, that even here exhibits unmistakable grandeur. Looking to the north, the beautiful peak of Mt. McLaughlin seems near at hand and shines, like Shasta, in perpetual snow. At our feet a small stream signalizes its commencement of a long journey and plunges to the north. This is Bear creek, a tributary of Rogue river and the beginning of Rogue River valley which was once a wide margin of vegetation and beauty on the shore of the ocean. We commence our descent by a sinuous course, circling the mountain with a narrow band cut about its rugged sides; now through deep cuts, thence across steel bridges more than a hundred feet in the air, from whence two more tracks may be seen below, near enough to throw

a stone on to them. From our flight across the great bridge we delve into a tunnel running to the west and when we emerge our course is to the northeast, then to the east and through another tunnel, which is almost vertically below the track we left a few minutes ago. We have turned almost completely around while roaring through a tunnel beneath the surface of the mountain. When we were spinning over the high steel trestle our heads also spun as we gazed into the depths to our right and noticed the track far below us, and now having made the circuit, we still look from the same side of the car but our view is up the mountain at the thread-like structure over which we have just passed but which is almost five hundred feet above us. The sight-seer is kept busy, for his attention is called from one side of the car to the other. He is passing through a formation of quartz, felspar and mica, a great granite dyke, and a moment more is spinning through cuts in massive sandstone where, if he had time, he could gather the beautiful shells that perhaps millions of years ago were endowed with life in the briny deep that covered this identical spot. Again an exclamation calls our attention and a finger points to a beautiful landscape far down the mountain toward which we seem plunging in headlong flight. This is a fragment of Rogue River valley, but ere we have time for an examination our course is changed and we seem to be rushing away from it with equal speed and twist our necks for a last view of so beautiful a picture, when we begin to swing about and are bearing down into the valley with exclamations of delight from everyone who has kept the cockels from his heart and his soul open to things external to himself. And so we go; in and out, through tunnels and cuts, 'mong towering fir trees and through open glades and clumps of oak and madrone, dancing a regular devil's jig as we rush to the accompaniment of steam and whistle, along a winding boulevard trimmed and decorated with manzanita and laurel, maple, alder and ash. Our engine sends up a warning whistle and we slowly wind around a point and come to a stop at a water tank and a station house. This is Steinman, eight miles from Siskiyou station where we emerged from the tunnel and commenced our plunge downward, though by the wagon road which we cross here, it is less than a mile and a half.

We have now descended a thousand feet with but little of advance. It is about twelve miles on to Ashland, but the rugged part of the mountain is behind us and from here on our speed is increased, for great care is observed in des-

cending the mountain to this point. In passing I will say that much credit is due to the Southern Pacific Company because of the careful manner in which they operate this part of their road, for serious accidents seldom occur here. The views from almost every part of our descent have been enchanting, not more from the grandeur (for everything in view seems to have been built on a gigantic scale, except the decorations of shrub and bush, trickling rills and beautiful glades), than for a kind of subdued beauty and charm, which appears like a sentiment of modesty, heightened by vari-colored flowers, shrubs, and sunshine. Now we proceed, through another tunnel, curving round sharp points, over trestles, through cuts of sandstone and sediment and an occasional point of granite, ever near the old shoreline. The beautiful manzanita with its pink flowers or red berries, that look like little apples—in fact, the name is Spanish for "little apple"—madrone, known here as mountain laurel, attracts attention for the beauty of its bark, splendid foliage and red berries, the oak with its mistletoe and, along the numerous creeks and rivulets we cross, the beautiful alder and ash groves, all add to a general charm which we pass so rapidly that we have no time to study, only to admire. To our right and just across the narrow, but now widening valley, rises the splendid Cascades and one of its giant spurs which reaches out to the west and is known as Grizzly mountain reaching at its highest point six thousand feet above the sea. That portion of the Cascades and Grizzly mountain in view from the railroad are grass covered, sparsely timbered and only moderately furnished with running water. I will ask the reader to stop off with me at Ashland and take a trip along the sides of Grizzly, where we find the strongest proofs that all of that great mountain was covered with the ocean at a period geologically recent. For eight miles before reaching Ashland we have been passing farmhouses, gardens and orchards that show the charm of thrift and prosperity, for we are entering one of the most famous fruit regions in the United States, and one that promises to vie with the world for the championship in apples, peaches, grapes and a variety of the smaller fruits and berries.

Further on I will give a chapter on climate and soils which I hope will sufficiently explain the basis of so much favor as nature has bestowed upon this spot. To the "Old Island" will be given a generous part of the credit.

From Main street in Ashland, the ground declines gently to the northwest for about a mile to the banks of Bear

creek, which here has its course to the northwest. Crossing the creek we commence the ascent of Grizzly; gently at first and gradually increasing until at eight miles on a straight line we reach the summit of Grizzly peak. We will suppose our time to be about the first of June and after making a careful examination of the mountain side up which we have traveled, we will return to this spot and revel in the landscape view, which is not often excelled. On the side of this mountain and in the nearer vicinity of Ashland will be found the best places to study the insular character of the Siskiyous. On the banks of Ashland creek and within the corporate limits of that city are located beds of oyster and other sea shells cemented together and bearing the stamp of very old geological records.

Here then we stand upon a shore that once looked out upon a broad expanse of water to the northwest, north, northeast and east, long before Grizzly, or the Cascade range came above the surface of the ocean. We will not stop at this time to make a mental picture of Ashland as a seaport, but will leave the reader to indulge his imagination at his leisure. It shall be our business to complete the proofs and then draw the picture. Returning now to Bear creek we will again ascend Grizzly and pursue our study as we proceed.

Chapter IV.

GRIZZLY MOUNTAIN AND MINERAL SPRINGS.

"And out of spent and aged things
I formed the world anew."

It will be observed that Bear creek from Siskiyou station for the first few miles of its course flows practically north until it joins with Emigrant creek which flows westerly from its source in the Cascades, thence the course is to the northwest to a point about five miles below Ashland, where it turns again to the north for about fifteen miles and empties into Rogue river. This gives a northwest trend to the Bear creek arm of Rogue River valley, in which Ashland is situated, with Grizzly mountain and the Cascades to the north, northeast and east and the Siskiyou Island opposite. This arm of the valley from a mere canyon at Steinman station, varies in width from one to three miles. The soil from the Siskiyous to Bear creek is granite and clay, containing a goodly quantity of lime and is excellent fruit, vegetable and berry land, but not especially prolific in its production of the cereals. On the north side of Bear creek the surface soil comes from Grizzly and partake of the character of the older sediments of which the mountain is composed, mixed with adobe from the disintegration of the basaltic lava that has flown from the top of that mountain and the product of mud volcanoes and hot springs that at one time were scattered generously over its sides. This slope of Grizzly mountain, as before suggested has little timber, and only a moderate supply of running water, except during the winter and spring, drying up later in the season. While the soil is very strong and fruitful in the growth of cereals as well as fruit, vegetables and berries, it is handicapped for want of water for irrigation With water, which can be conserved by the use of reservoirs, there are thousands of acres of excellent land along the sides and gulches of Grizzly, which will some time in the future, support a large population of active and industrious people. Looking at it from the railroad it appears to be a regular and continuous climb from the bank of Bear creek to the summit. This, however is not so, for upon every turn the explorer runs into little valleys snugly tucked away among the rounded knobs and slopes, and many a "flat", sometimes containing hundreds of acres of splendid

soil and often a good spring. Clumps of oak and scattering pine and fir give it a park-like appearance in the spring and early summer with many a shady nook and picturesque cove.

About three hundred feet above Bear creek and a mile from it, is a well that was driven down by the business men of Ashland five years ago in prospecting for oil. They sunk to the depth of one thousand eight hundred and twenty feet and abandoned the undertaking. The top of the well is practically two thousand feet above sea level and the bottom is, therefore, almost down to the level of the ocean. In the whole depth the well borers did not get through the sedimentary formation. From top to bottom they passed through stratum after stratum of shale, gravel and clay, with occasional indications of coal and lignite. These strata were sometimes of considerable thickness and sometimes thin, alternating from one to the other, indicating frequent changes of the source from whence these sediments were derived. Passing on up the mountain to an elevation of, five hundred feet further, there is an outcrop of lignite which has been prospected for coal. Tunnels run into it from twenty to one hundred feet have, in places, disclosed coal of a good quality and fair in quantity, but dipping into the mountain at angles varying from five to twenty degrees. The space between the oil well and the horizon on which the coal is found is filled with clay, shale and gravel. On the top is a very fine quality of clay of unknown thickness rich in fossil leaf impressions. In places a thinly laminated structure of slaty character is found, which on separation of the lamina is seen to be well filled with various kinds of leaf impressions, some of which resemble madrone, willow, sequoia, ferns, swamp growths and a variety of twigs, small branches of willow, alder, ash and grasses. It is evident that this formation consists of a sediment that was deposited after, or during the spring freshets along the margins of shallow lakes or marshy lands. The great regularity of the layers shows also, that the ground containing these lakes and marshes was level and of considerable extent, Though it is now on the side of a mountain sloping upward at an angle from ten to twenty five degrees and dipping into the mountain almost at right angles with its slope. Above these shales and slates comes a heavy mass of conglomerate which exposes a thickness in places of fifty feet, with a talus at the base that may conceal as much more. This conglomerate is composed of rounded pebbles and boulders that give evidence of hav-

ing been eroded by stream action and not by beach action. These boulders are of quartzite, flints, chalcedony, jasper and other metamorphic and aqueous rocks and are unlike anything we find in the old island. They seem to have traveled a long distance and are worn perfectly smooth. Judging from the size of many of the boulders it is evident that if they were borne here by stream action it must have been a very large stream. This boulder bed extends from a point east of Ashland to Eagle Point on Butte creek, a distance of nearly twenty miles. On top of this conglomerate rests a coarse sandstone carrying a meager quantity of fossil leaf impressions similar to the lower clays above described. This sandstone has an apparent depth of a thousand feet, and in places huge trees of a species of cedar or redwood are lying, end on, on the top of the conglomerate with, in places, two hundred feet of sandstone on top of them. These trees are pertified and seem to have drifted to their last resting place when these conglomerates were covered with shallow water. Still above the sandstone and net less than two thousand feet above the top of the oil well, we find a flow of basaltic lava capping the lower sediments. This gives from the bottom of the oil well to the lava capping a depth of at least four thousand feet of sediment. The top of Grizzly butte, still two thousand feet higher bears unmistakeable evidence of having once been the crater of a volcano. From the summit of the butte the ridge declines to the northwest by west and in many places shows evidence of geologically recent volcanic action. Numerous small craters, spinnacles and beds of lava bear evidence of this fact. In many places along the slope of this ridge are found hummocks that were once mud volcanos and many sites of springs, now extinct, but which show in the petrified wood lying along the slopes below them, that they were heavily charged with gases that prveail under active volcanic conditions.

Along the sides of Grizzly ridge and parallel with its axis are three distinct beach lines one above the other, showing that there were at least three distinctively active periods in the elevation of this mountain. One familiar with the present action of the ocean surfs, having observed the manner in which they cut and carve the sandstone with which they come in contact, would recognize its work on these great sandstone cliffs that are cut and carved in the most fantastic manner, columns, minerets, spires, great bowls, pots and natural tunnels and bridges, mark these beach lines. In places even the beach lines have been ob-

literated by heavy lava flows. This is particularly apparent along what is known as the "Dead Indian" road near the junction of the main Cascades and Grizzly ridge. In this vicinity may also be seen some beautiful specimens of an agglomerate, consisting of rounded pebbles gathered in a matrix of lava. These forms came about by a viscid lava flowing down a stream bed where it gathered the water-worn pebbles as it rolled along, like plums in a pudding, finally coming to rest when it had become too stiff to flow further. To the east and southeast of Ashland, along the foot of the Cascades are numerous mineral springs producing copious flows of potable waters of an excellent quality and containing properties highly recommended as medicinal. Some of these springs are being utilized, the waters being bottled and shipped in considerable quantities. They are highly palatable and are very largely used in mixing fancy beverages. The "Wagner Springs" particularly, have been used extensively for many years as a summer resort under the general designation of "The Soda Springs." The proprietors of this property have quite an extensive bottling establishment and derive a considerable revenue from the marketing of the water. These springs are about eleven miles southeast of Ashland, and two miles further up Emigrant creek, the Tolman springs are quite famous as a resort. There is an additional attraction at the Tolman springs in the way of emanations of carbonic acid gas, and other gases combined, which escape not only with the water but also from fissures and cracks in the rocks, in the bed of the stream and about the banks and sides of the canyon. This gas had great renown among the Indians when the whites first made their appearance in the country. The natives termed it "hi-u-skookum medicine" and used it in the treatment of rheumatism and other afflictions. They dug little depressions where the gas was escaping and spreading fir boughs in the bottom placed the patient in them and attended him carefully until he became unconscious from inhaling the gas, then they removed him and by skillful manipulation and rubbing brought the patient back to life. After a day or two of feeding on teas made from herbs the gas bath was repeated until the patient recovered from his malady. These springs were improved by General J. C. Tolman, who also erected a hotel and built cottages to be occupied by those who wished to spend a season and take a treatment of water and gas. The General died and the place has gone into decay, not however, until quite a reputation was ac-

quired for the springs. It is not safe for one not familiar with the effects to submit himself alone in one of these gas stalls. All are effected alike; unconsciousness steals over the patient or experimenter, in so seductive a way that a delicious repose soothes him and if no one is near to remove him and he has not been warned death will certainly follow. Birds, snakes, squirrels and other small animals and reptiles are frequently found lying dead in these places overcome by the gas. Smith's springs, not far away are also of the same character and have been fitted up with "gas bath" attachments. On the south slope of the mountain, by the side of the railroad and three miles from the summit crossing of the Siskiyous are situated the "Colestein springs" with bottling establishment and hotel. This is also a noted place of resort, and situated as it is, almost four thousand above the sea in the Siskiyou mountains and directly on the shoreline has become a very popular place for summer outings. Still further down the slope of the Siskiyou mountains to the south, almost directly on the California line, are the "Shattuck" springs of the same character, but unimproved. These springs are also on the old shoreline and about three miles west of Coles station on the S. P. R. R.

Returning now to a point about four miles east of Ashland, on Emigrant creek is another cluster of springs that promise to become famous from the strong addition of Lithia contained in the water. These springs have long been known but until recently were owned by people who would do nothing to improve them, nor sell to any one who would do so. They have recently been purchased by Mr. Harry Silver and Mr. C. H. Gillette of Ashland, who are preparing to bring them into beneficial use. The springs and immediate surroundings are very picturesque as will be seen from the illustrations published herewith. Inasmuch as the propoerties of lithium are so well known in medical science, and for the further reason that these springs show by analysis a larger percentage of lithium than almost any of the most famous so called lithia springs in the country I give the analysis recently made, as follows:

(Parts to a million of water).

Soluble silicates of Iron and Aluminum	125
Carbonate of Lime	977.8
Carbonate of Magnesium	653.1
Potassium Chloride	260.2
Sodium Chloride	3657.5

Sodium Carbonate	2548.5
Lithium Chloride	51.7

Several clusters of soda springs are found along the Sacramento river between Dunsmuir and Mt. Shasta. Travelers on the Southern Pacific will not easily forget the "Shasta Springs" where all passenger trains stop ten minutes to allow passengers to drink soda water from the beautiful fountains prepared by the Company and to enjoy the delightful scenery there which is not surpassed on any other road on the continent. In each instance where they are found it will be seen that they are in the neighborhood of extinct volcanic vents. This will be found to be true in various parts of the world where such springs are common. It will be seen that the waters of these so-called "soda springs" the world over, have been noted from the earliest times for their medicinal properties, and in countries of dense population become places of great resort. All of the springs above noticed are heavily charged with iron, magnesia and sodium chloride, or carbonate, but so far as I am informed lithium only appears as a trace, except in the springs of which I have given the analysis. These springs are an additional evidence of extinct volcanic action and of heavy bodies of organic matter, such as we find forming the mass of Grizzly mountain.

Within the corporate limits of Ashland, and just outside but near by, we also find white sulphur springs varying in temperature from seventy to one hundred degrees. These springs have also become popular and are pronounced equal to the White Sulphur springs of Arkansas. One of these springs located in the streets of the city increased its flow, perhaps fifty fold, immediately following the earthquake at San Francisco in April 1906, and continued so augmented for several days but finally returned to its normal rate. I ought not to omit to mention the presence of cinnabar in the vicinity of these sulphur springs and the evidence found in the deposits from them that they were, at no very distant time in the past hot, and are now steadily cooling. Examination throughout the world shows that the deposit of cinnabar (quicksiver ore), has as a rule been associated with hot sulphur water, and in many places around the shoreline of this old island, we find valuable deposits of that mineral. In places these deposits have been worked with profit. Perhaps there are not many places within a like area, will be found so great a variety of mineral springs, both warm and cold, as will be found

in the various corners of Rogue River valley and the adjoining mountains. Many of these springs have medicinal virtue and some are poisonous.

As above suggested the evidences are unmistakable that along the sides of Grizzly were many vents for the escape of lava, mud and hot water, until the fires below were extinguished and by degrees the springs lost their heat and the mud volcanos ceased their action, not however, without leaving a record of the character of the waters discharged, by the petrified wood which is found in abundance. The silicification of the wood shows the waters to have been heavily charged with silica. Near the crossing of the Dead Indian road, a few miles east of Grizzly butte, is a large area of kaolin which is being quite extensively shipped to Portland and used in the manufacture of the wares of the Western Clay Company. It is claimed that this clay is of great commercial value, and dishes which have been manufactured from it compare favorably with those made from the kaolin clays of Pennsylvania. The great quantities of various kinds of clay, shale and dolomite, seem to offer inducements for the manufacture of cement, now coming into general use Building stone of a variety and unexcelled quality promises to become one of the resources of this region. The granite and marble of the old island and the inexhaustible quantity of sandstone along the shoreline only awaits transportation facilities to supply half the continent. Other valuable minerals and metals will be exploited in subsequent chapters.

Chapter V.

A VIEW FROM GRIZZLY MOUNTAIN.

* * * * : the tall rock,
The mountain and the deep and gloomy wood,
Their colors and their forms, were then to me
An appetite; a feeling and a love,
That had no need of a remoter charm,
By thought supplied, or any interest
Unborrowed from the eye."—(Wordsworth).

Having exploited the shoreline and its adjacent mountains from Ashland to the point of junction between the Siskiyous and the Cascades, and called attention to the varied formation and natural peculiarities bearing upon proof of the insular character of the Siskiyous in the long ago, we will return to the summit of Grizzly mountain and revel for a time in the panorama to be obtained from there.

As remarked, Grizzly butte has an altitude of six thousand feet. On a direct line it is about eight miles from Ashland, though to the "tenderfoot," looking from below, it does not appear half that; the climb, however, brings about a dis-illusion. Our starting point has an altitude of two thousand feet; therefore our climb will be four thousand. The slope of the mountain faces the south, and in the month of June one is likely to encounter warm weather and the scattering clusters of shade will be greatly appreciated. It is a good four hours' climb, but at every halt for breath we are repaid in the view we get. Before we have ascended half the distance we have a fine view of Mt. Shasta which is directly in line with the summit crossing of the S. P. road; the lowest pass of the Siskiyou mountains.

Having reached the top, a magnificent panorama is in view on every hand. Mt. Shasta towers to a height of 14,440 feet, and its glaciers and snow make of it a brilliant spot among the mountains of northern California. To the south and southwest the massive Siskiyous rise from six to more than eight thousand feet and are covered with dense growths of pine and fir. Some of the magnificent forests for which Oregon and northern California are noted the world over, are before us. Beyond the Siskiyous through its lower passes, we see Scotts mountains, also a part of the old island. Dark and imposing, these mountains rise into the regions of snow; their sides cut and scarred by deep canyons through which the old island pour-

ed its waters into the ocean long before the mountain on which we stand had appeared above the surface. Between us and this old island lies the narrow valley which we have just left and stretching along the old shoreline lies Ashland in plain view. All of the Bear creek arm of the Rogue River valley is just below us sparkling in sunshine and beauty at the foot of the great granite mountains. To the east and northeast are the Cascades with Mt. McLaughlin only forty miles to the northeast rising almost ten thousand feet and clad in perpetual snow. This is one of the most symmetrical and imposing mountains on the Pacific coast. Around its base and stretching away to the south and east lies one of the finest forests on the continent. In places league upon league of this forest seems almost level and unbroken. Here the sugar pine, white pine, Douglas fir, white fir, and many other varieties of conifers hide beautiful lakes, glades and natural parks that to him who has wandered among them, have left memories of delight upon which he may draw with the keenest pleasure for a life time. Beyond McLaughlin, still to the northeast and about seventy miles distant, as the crow flies, are seen the high crags about Crater lake. Looking away to the north and northeast are towering summits as far as the eye can reach aided with the best field glass. Following the slope of the mountain from our feet to the north, it falls away rapidly into the heavily timbered canyon of Antelope creek. Following the line of this stream toward the northwest we see it widening, until at the distance of five or six miles it affords width of valley and farms are seen. A few miles further on it debouches into the main Rogue River valley. Again looking from our stand on the summit of Grizzly, toward the north we see another ridge, similar to the one we are on, but not so high. This ridge separates Antelope from Butte creek, which also has its course to the west and empties into Rogue river near the center of the valley. Along Butte creek is a valley larger than the Bear creek arm, which reaches almost to the foot of McLaughlin. Beyond that again comes Rogue river up which one may travel among its farms and orchards for twenty five miles. Though the whole valley, almost, is in view we will first notice the streams that are marked by canyons that have worn their course down the mountains and enter the valley from every direction. Each of these mountains has more or less of a margin of fine land suitable for agriculture and horticulture and it will be found that almost every available

spot has been located and the business of home building begun. A more beautiful prospect than the main body of Rogue River valley presents from our lookout could not well be imagined. Each of the entering streams has more or less of valley margin where homes are made. Up some of these streams the valley extends for miles, affording choice and picturesque homes. These places have the advantage of mountain range for stock that will continue to be a common pasturage . They also usually have the advantage of an abundance of water. The streams are clear and cold and where of moderate size are well supplied with trout. Such places also have the advantage of game such as is found here. In traveling through the valley on the railroad or by team over the main highways, these little valleys reaching up into the mountains are not seen, and the stranger gets the idea that the valley is much smaller than it is. Again from our perch on Grizzly we see to the southwest and west a lower range or ridge of the Siskiyous with the main summits in view beyond, suggesting a valley between, but which is out of sight. The suggestion of a valley there is not deceptive, for if we were to pass over the ridge we would come into the Applegate valley, not so large as Rogue River valley but as favored by nature in every other respect. Its climate is the same and its numerous homes indicate the same degree of thrift and happiness. Applegate river is one of the principal tributaries of Rogue river and is one of the most beautiful and romantic streams to be found in the Siskiyou mountains. In addition to agriculture, horticulture and stockraising, the Applegate country is one of the most important mining regions in the state, of which more will be said in later chapters. Looking still to the west of Applegate mountains, which we must remember are only a part of the Siskiyous, we see other ridges with still other ones beyond, which to the initiated, suggests Williams creek, Sucker creek and the Illinois River valleys, all within the old island and belonging to the Siskiyous sytem of valleys. None of these valleys can be seen from the main routes of travel and even their existence is not suggested to the traveler, unless in conversation with some one familiar with the country, but from our perch on Grizzly, the various ridges, one beyond the other are sufficiently suggestive to prompt enquiry. From all of this it will be seen that a very imperfect knowledge of the extent of the valleys of this part of Oregon is obtained by the traveler who learns nothing except what he can see from the car window. When I

come to speak of the climate and productions of the Old Island, it will be understood that all of the valleys belong in the same category.

Following the summit of Grizzly ridge toward the west for about four miles brings us to a point from which nearly all parts of the main valley can be seen. We now observe that it has its greatest length from Steinman to a point several miles northwest of Grants Pass; a distance of about seventy miles. At its most westerly point Rogue river enters a very rugged canyon which continues almost to the ocean. The greatest width of valley is perhaps 20 miles, and a more beautiful country to look upon would be hard to find. The beautiful and romantic little city of Ashland, which has been made the starting point for these observations, is in plain view along the foot of the Siskiyous. Five miles to the northwest is the village of Talent, situated on the banks of Wagner creek which flows from the Siskiyous and for a distance of five or six miles is being crowded with fruit farms and plenty, yet out of sight from the railroad. Three miles further on is the village of Phoenix in the midst of farms and orchards. Five miles north of Phoenix is the rapidly growing little city of Medford, practically in the center of the valley and with a wealth of farms and orchards surrounding it. Medford in population ranks next to Ashland and is destined to be the commercial center of the valley. Its growth is rapid and substantial. A short line of railroad connects it with Jacksonville to the west and the Crater Lake railroad has its junction with the S. P. road here and now extends northeast to Eagle Point and is intended to open up a fine body of timber to the northeast. Ashland, which is especially noted as a home and school town, and a place of great scenic attractions seems destined to become the Colorado Springs of Oregon. The purity and abundance of its water, the great variety of its mineral springs and noted as the site of one of the State Normal schools, a Chautauqua assembly, which meets yearly, beautiful parks, flowers and fruit. Its water supply comes from Ashland butte, is abundant for all purposes and is absolutely owned and controlled by the city, making it one of the most favored localities on the coast. The foregoing marks the distinctive features of Ashland, while Medford's distinguishing feature is its central location in the valley and its consequent advantage as a commercial center. There ought not to be any feeling of rivalry between these two growing little cities, for that in which each excels is not a matter of competition between

them, and yet there seems to be a senseless feeling of rivalry with its usual accompaniments.

Five miles west of Medford is Jacksonville, the county seat of Jackson county and the oldest town in southern Oregon. Jacksonville was first settled as a mining camp, and for more than fifty years has been one of Oregon's most noted mining localities. Until the building of the S. P. railroad Jacksonville was the chief town in southern Oregon. As I have elsewhere said, it occupies a cove at the foot of the Siskiyou mountains which once formed a land-locked harbor when the old island was surrounded by the ocean. The site and vicinity of Jacksonville was once very rich in placer gold and millions of dollars in gold dust have been handled there since the first discovery about sixty years ago. If we were writing a political history of Oregon it would be necessary to give at least a chapter to Jacksonville. After Medford sprung into existence, and Jacksonville had been left five miles away from the railroad, it was shorn of its laurels as the chief town, but still retains an extensive business and is the chief supply point for the mines to the south and west and for the trade of the farmers and orchardists of the Applegate country. There is not a more beautiful location for a town in all the valley and the development of the copper mines south from Jacksonville, in the heart of the Siskiyous, of which mention will be made further on, has given to the old town a new impetus.

Remembering that we are viewing the valley from a point of Grizzly mountain, from which all of these towns are plainly seen, we look north from Medford along the railroad and at the distance of four miles see Central Point another thriving town, perhaps as much entitled to be considered the central town of the valley as its neighbor. This town is also flourishing and exhibits its orchards and farms with as much pride as does Medford. Some of the most noted orchards of the state are just at the outskirts of Central Point. Eleven miles northeast of Central Point is Eagle Point, not on the railroad, but on the banks of Butte creek and located in one of the finest sections of the valley. Eagle Point is at present the terminus of the Medford and Crater Lake railroad. Its position is picturesque and is surrounded with fine farms and orchards with an abundance of water for irrigation and other purposes. Butte creek affords many excellent sites for power. The stream is one of the largest that enters the valley and comes direct from Mt. McLaughlin. The Butte creek arm

of the valley constitutes an important part of the county and extends up that stream for ten or twelve miles above Eagle Point, is populous and rich.

Returning now to Central Point and following the railroad five miles further to the north we reach the bank of Rogue river at the new town of Gold Ray. Here a wealthy company has placed a fine concrete dam across the river and constructed a large power plant that furnishes all the valley with electricity. The company has already laid out at least a half million dollars in their project and are planning lines of electric roads that shall bind the whole valley. Electricity is furnished for the operation of mines and machinery in all parts of the valley and surrounding mountains. Perhaps there is not planned many more extensive electrical plants on the coast, nor with finer prospects. The stream is an ideal one for such purposes. Near by is the Table Rocks, one of the points of scenic interest along the line of this "Road of a Thousand Wonders." These rocks cover a considerable area, several miles in extent. They rise to a height of six or seven hundred feet above the river with a talus slope for the first two or three hundred feet, terminating in vertical cliffs of basaltic lava, the top of which is practically a level plain covered with the usual bush growths of the region. At the base of the talus is sandstone with indications of coal. To the north of these cliffs and not in view from the road lies Sams valley, really a part of Rogue River valley, and one of its richest sections. It is several miles in extent each way, and as an agricultural, horticultural and dairying region ranks high. The railroad from this point on to Grants Pass, about twenty five miles runs directly along the bank of Rogue river. At about six miles below Gold Ray we cross the river and draw up at Gold Hill, a prosperous and growing town of six or seven hundred people who are very enthusiastic in discussing the future of their little city of which they are justly proud. Mining is extensively carried on in the vicinity, besides which, Sams valley and meadows a few miles to the northeast, are supplied at Gold Hill and from there do their shipping. From this point to Grants Pass the valley is narrow and most of the available spots are occupied by farmers, miners and fruit growers. As we go spinning down the north bank of the river we notice streams coming in from the mountains on both sides bordered with ranches, running back into the mountains and everywhere we see mining operations and do not need to be told that in this occupa-

tion many of the farmers busy themselves during that season of the year when the streams are full. Nine miles west of Gold Hill we pass Woodville, another prosperous village. Here the lumber yards tell us of mills in the mountains; hop drying houses, fruit dryers and milk cans show diversified industry. Extensive mining is done in the vicinity, and the indications show that we are yet along the shoreline of the old island. Nine miles further brings us to Grants Pass, the county seat of Josephine county. This is a very thriving little city of about four thousand inhabitants. It is the principal town of the county and does a large business. It lies on both banks of the river and has a large area of the valley tributary to it. Being the only place of any note in the county it has the trade of a very large area. This particular section is becoming noted for the cultivation of grapes as well as the other products for which southern Oregon is famous. Williams Creek valley, Althouse, Sucker creek and the Illinois vallies are all within the limits of Josephine county and the old island. It has also the largest mining interests of any of the towns of southern Oregon. From Grants Pass the railroad bears off to the north through the mountains and leaves Rogue River valley. We will therefore, not follow it further, as we are dealing with the pre-historic Siskiyou island and will have more to say about it later on. It will be remembered that we commenced this view from one of the western points of Grizzly mountain, from which we were able to see all except that which I have described after leaving Gold Hill.

Chapter VI.

THE CLIMATE AND SOIL OF ROGUE RIVER VALLEY.

> "I hold that we have a very imperfect knowledge of the works of nature till we view them as the works of God—not only as the works of mechanism but works of intelligence, not only as under laws, but under a Lawgivtr, wise and good."—(James McCosh.)

The climate of Rogue River valley is in all essential respects identical with all other valleys that belong to the northern slope of Siskiyou island. This slope, however, differs from that of any other portion of the Pacific coast. Any good map of California and Oregon will show that the Sierra Nevada and Coast Range of mountains in California, are practically parallel with each other and are separated by two great central valleys of that state, i.e., the San Joaquin and Sacramento; that at the northern end of the Sacramento valley a great cluster of mountains fills the space from the Sierra Nevada westerly to the ocean and extends far up into Oregon, and that in the last named state the same great cluster fills the space between the Cascades and the ocean until you reach a point almost west of the southern end of the Willamette valley which separates the Cascades from the Coast Range. This great cluster constitutes the Old Island with which we are dealing and has its greatest length north by a few points west and is over two hundred miles long, and in its greatest width is nearly ninety miles. The state line between California and Oregon divides the Old Island, about equally between these states. When we come to consider this island as a great cluster of mountains before the Cascades or Coast range came above the water, and that when they did rise the Cascades closed upon the Siskiyous at an altitude of more than four thousand feet and that the Coast range abutted upon the island at its northern and southern extremity on a line with its western shore, we will readily understand that it became a great watershed, throwing the waters south toward the Sacramento and north toward Rogue river and the Umpqua. In passing from San Francisco to Portland, the summit of the Siskiyous is the highest point. Shasta valley in California lies to the east of the Old Island and has an altitude of about three thousand feet or more, with the high snowy Scotts mountains to

the south and equally lofty Siskiyou mountains to the north and west, and Mt. Shasta with its perpetual snow and glaciers on its southeastern border, we can easily understand that its climate is rendered more rigorous thereby. Rogue River valley ranges in altitude from one thousand to two thousand five hundred feet above the ocean, and while it is also surrounded by high mountains, yet with its lower altitude and the absence of such mountains as Shasta to directly affect it, it is apparent that its climate is much modified. The average rainfall for the past twenty-four years in Rogue River valley has been a little less than twenty inches, and snow seldom falls to a greater depth than two or three inches nor remains on the ground more than a few hours. A sleigh or cutter would be a curiosity about farm yards, and water pipes often remain uncovered throughout the winter without freezing. There are times when the thermometer falls below freezing point, but for it to reach zero is a very rare occurrence. Roses often bloom in the open air until Christmas and in sheltered places still later. Strawberries fresh from the vines are a usual luxury for Thanksgiving and fruit trees frequently bloom in February. Outside pasture for stock is green the winter through and range stock seldom require any feeding. I am now writing in the middle of January, 1908, and up to the present time there has been no more than a simple suggestion of freezing this winter and the mountain sides look green and spring-like. Up to this time there has not been snow enough up to an altitude of twenty-five hundred feet to suggest a whitening of the ground, though the higher mountains are covered with a generous supply. In a few places about the valley, figs, oranges and lemons grow and sometimes mature, though they are not considered as more than ornamental. It is the home of the peach, apple, pear, apricot and prune, and as fine melons as can be found in any country are produced here in great abundance and shipped to less favored places by the car load. The apples and pears are unexcelled and horticulture is becoming the chief industry. Apples and pears are shipped to the great markets of this country and foreign parts and the highest prices ever paid in the markets of New York for such fruits have been paid for Rogue River shipments.

Irrigation is not extensively resorted to, but where it is desired the mountains furnish an abundance of water. During the summer months the skies are warm and sunny, with occasional showers sometimes torrential in character. This will be easily understood when we consider the high

mountains as great condensers of moisture. The rarity of the atmosphere in the neighborhood of their summits produces draughts of colder, and consequently heavier air, which, displacing the warmer, lighter currents of the valley carry down moisture, that having condensed in the cooler air above is now expanded to the form of vapor, mist and rain, gently or violently according to the degree of the meteorological changes that take place. These currents of air cooled and directed by high mountain ranges, and supplied by nearby ocean currents are subjected to a variableness of conditions that must prevail in such an environment.

The great diversity of the climate found on the Pacific coast is plainly due to the Japan current and the trend and height of the mountain ranges. The usual trend of such ranges on the American continent, is northerly and southerly parallel with each other. The warmer a current of air, the higher it will fly. Cool it and it will drop lower. The higher it goes, the cooler and dryer the atmosphere and the greater is the tendency toward condensation and consequent precipitation. If the currents of air through which the moisture falls are cold enough snow or hail will result, otherwise it will be rain. The Japan current of the Pacific ocean coursing southerly, parallel with the coast, bears water warmer than the main mass causing vapor to rise from its surface. The heavier, because colder, air from the mountains inland naturally drops toward the ocean, where the water is warmer and the atmospheric vapor is consequently lighter. This vapor is lifted above the heavier air which settles to the surface and displaces it. The vapor so lifted rises to atmospheric currents that are running landward and are borne inland and dropped as snow on the high mountains and as rain in the valleys. The Coast range in Oregon and Washington, while high enough to condense a great deal of the moisture being borne inland, only lightens the heavily burdened clouds and enables them to rise higher, just like dropping ballast from a balloon enables the aeronaut to go higher and fly further. The great width of the Columbia river enables vast volumes of these moisture laden clouds and fogs to pass inland until the Cascade range interposes its mass and height, and the clouds so laden are turned aside into the valleys on either hand and, effected by the cold breezes from the mountains, copious rains result. The Coast range not rising high enough to be impassable for the bulk of the heavily laden clouds, furnishes a way in its lower passes where they fly over and reinforce the volumes sent

up the Columbia. The Willamette valley is, therefore, bountifully supplied, and the residue sent across the Cascades to eastern Oregon, or southerly across the Calapooia mountains to the Umpqua valley, where they are reinforced by a goodly supply sent inland tnrough the pass furnished by the Umpqua river directly from the ocean. Still other ranges and spurs of mountains lie between the Umpqua and Rogue River valleys, over which not a very great surplus passes after supplying the Willamette and Umpqua, leaving Rogue river to other sources of supply. It is true that Rogue river also flows directly into the ocean, but for fifty miles of its lower course it passes through a deep and narrow gorge upon each side of which the mountains rise to a great height. Threfore Rogue river does not furnish passage for any great quantity of moisture laden clouds from the ocean, and that coming inland over the high Siskiyous is very largely precipitated as snow on the mountains. This insures an abundance of water to be furnished by the streams in the summer for irrigation and other purposes and relieves us from the annoyance of continued rains in the winter time. It will be seen that Rogue River valley, in fact all the valleys lying on the north slope of the Siskiyou island, have a different environment from the other valleys of the coast. It is far enough inland to be shut off from some of the annoyance of extreme humidity, high enough and so environed with snowy mountains as to be releived from extreme heat and drought so characteristic of southern California, and with sufficient influence from altitude and ocean currents to take it out of the category of "cold" climates. The valleys on the north slope of the Old Island have, therefore an unique climate, and easily explainable from the natural conditions environing it—conditions that were marked out by the architect of the Universe while yet the Pacific ocean covered a great deal of the continent and Europe was still largely under the sea.

We are yet to consider the soils which to a great extent determine the wealth and value of southwestern Oregon. From what has already been said the reader will remember that the mass of the Siskiyou mountains is largely of granite. Hence we will see that granite very generally enters into the soils of the valleys, especially on that side of the valley directly bordering on the Siskiyou mountains. On the other side, that bordering on the Cascades and the spurs of that range, we will find the soils to be very different. Considerable space has been used in describing

Grizzly mountain and its formation, for the reason that it may be taken as a type of the Cascade formation. We have seen that there is at least four thousand feet of sediment forming this mountain and that it is capped with basaltic lava, and that there are many extinct volcanos and mud springs on its sides. This is not only true of Grizzly but of other spurs and ridges of the Cascades. The disintegration of the shale, sandstone, clay, gravel, etc., would of course produce soils consistent with the character of material being used. The disintegration of basaltic lava, and the mud from volcanic springs produce a "doby" soil, very strong and productive but sticky and disagreeable to work or travel over when it is wet. From the Siskiyou side comes granite, clay and lime which, when mixed near the center of the valley, with the soils coming from the Cascades forms a combination very difficult to beat.

Remembering that over two thousand feet of the sedimentary formation of Grizzly is above the top of the oil well, and almost as much more between the top and bottom of the well, we will realize that an immense amount of that which was raised out of the ocean where it had been deposited, has been washed away and that the present surface of the valley lies more than a thousand feet below the great boulder beds described in an earlier chapter. Lying between Medford and Eagle Point is a broad level tract of country, many miles in extent, which is called the "desert," because it is covered with washed pebbles and boulders. This so-called "desert" lies along the Cascade side of the valley, and a few miles up the slope of the mountain will be seen here and there the exposed boulder cliffs with the sandstone resting on top. Elsewhere we have examined and described this sandstone and the records of sea action on the cliffs and the fossil remains contained in them. Miles and miles of these sandstones have been eroded and washed away by the natural wear of the sea against the mountain. The softer materials were carried away by the billows of the sea. The shales, clays and sandstones were broken into fragments or reduced to sand, but these boulders were not so easily disposed of. By the time the boulder beds were reached in the course of the erosion of the mountain, an arm of the sea, or possibly a lake had formed where Rogue River valley is and into it these boulders were washed or rolled, as the cliffs were disintegrated and carried seaward. That this was the result of sea action has been shown by the old sea beaches and the surf carved sandstone lying on top of the boulder beds.

Along Bear creek and other streams having tributaries coming from this great mass of sediment, will be found soil composed of a fine mould that has been enriched by the supply of organic matter held in the sedimentary deposits that are being drawn upon by every spring and winter freshet. Elsewhere I have mentioned a horizon of coal. Near Siskiyou station this coal is almost four thousand feet above the sea. Following the coal croppings to the northwest along Grizzly mountain we see the horizon gradually becoming lower and lower, which really marks the grade of the uplift, for this horizon of coal was in all probability at one time practically at the sea level. At Coos bay we will find the coal mines being worked at the level of the ocean, yet it is doubtless, the same deposit, or rather a formation of coal produced all along this line at, or about the same period, when the shore we have been tracing was continuous around the old island and being bathed by the waves of the sea. The Cascades rose first and carried the country gradually up with it, sloping seaward. Afterwards another folding has occurred where the Coast range is, and as the range rose slowly from the water it lifted the country lying between it and the Cascades, beginning that expansion of the continent which has finally produced the Willamette and Umpqua valleys, and shut out the sea from Rogue River valley. For long ages the Willamette valley was a great inland sea similar to what Puget sound now is, and the Columbia river was a great strait similar to the straits of Fuca, connecting the Willamette sea with the ocean. This uplifting continued gradually until the sea was entirely expelled and the Willamette was left to be worked by Nature's methods into the wonderful country which we now see it. After the rising of the Coast range as before suggested, it appears that Rogue River valley became a lake or land-locked arm of the sea. The fossils and fresh water beach lines, now plainly marked on the slope of Grizzly indicate this. During that time there is no doubt that much of the sediment that forms the present soils of the valley was being deposited, from the older worked over sediments that were being washed from the surrounding mountains, and thoroughly mixed at the bed of this lake or sea arm. The waves of the ocean no longer operating along the sandstone and boulder cliffs, the wearing away of these masses became very slow and the boulders were being left on the talus slopes and foothills of the valley, and were not carried down into the valley-surface deposit, except on the so-called

"desert", which appears to have been the last to be drained of its water and there we find the boulders on the surface, in little rounded areas depressed in the middle, just as we see the coarser materials of deposit now being left in little clusters and bunches at the bottoms of shallow lakes that are disturbed by waves and currents. That these deposits came from the Cascade mountains is evident from the fact that the soil deposited with the boulders is, at least on the top, "doby" from the basaltic lava that is only found in that direction. This boulder-strewn area will sometime in the future be reclaimed by removing the boulders and cultivating the strong "doby" soil that is plentiful and very productive. To discuss the possible source of these boulder cliffs would lead too far afield for the purposes of this little book. Besides nothing more than a theory could be advanced to account for them. It would, however, call us into a geological review of eastern Oregon and a more elaborate discussion of the Cascade range, old river beds beyond the mountains and the fossil beds of the Great Basin between the Cascades and the Rocky mountains. We will not go into this at this time, but in the following chapter I will add a word on Crater lake which will involve some further notice of the Cascade range.

We have already devoted considerable time in discussing the formation of the Cascade range in order to show its relation to the Old Island and influence upon the climate and soil of Rogue River valley and have said little of the formation, mineral resources and scenic attractions of the Siskiyous. In fact it appears to me that among the important assests of Oregon are its scenic attractions. These of course are not confined to the section of the state of which this little book assumes chiefly to treat. In the belief that the divesion will not detract from the reader's interest, I will insert as the following chapter, a lecture (somewhat changed), delivered by me before the Oregon Development League at Salem in November, 1906, and which was afterwards published in the Chamber of Commerce Bulletin at Portland. The subject assigned to me was Scenic Oregon, a subject that could easily be made to fill a volume and in the discussion of which a single lecture was not adequate.

Chapter VII.

SCENIC ATTRACTIONS AND HOW WE SHOULD VIEW THEM.

* * * * "And I have felt
A presence that disturbs me with the joy
Of elevated thoughts; a sense sublime
Of something far more deeply interfused,
Whose dwelling is the light of setting suns,
And the round ocean and the living air,
And the sky, and in the mind of man."
—(Wordsworth.)

This is an age of commercialism. Dollars and cents furnish the trade mark in the world's activity. Climate and soil must stand the test of adaptibility and productiveness, and the label on the can or package constitutes the best advertising matter in this age of money getting.

The rigors of climate create resourcefulness in the methods devised to overcome and modify the effects, and its very inconveniences are productive of new fields of energy and enterprise. The ancient storage batteries of the sun are exploited in the development of coal mines in climates most rigorous and regions the most desolate.

The magnificent forests of our mountains are attacked by an insatiable savagery born of greed. The streams that come leaping, sparkling and singing from the mountain heights are viewed with the eyes of cupidity and engineers are employed to estimate the horsepower they see running away, or the acres that may be irrigated by them, the dollar mark being kept constantly in view.

The moment a new usefulness is discovered in the endless bounties of nature, the genius of man finds a method of appropriating it. The beauties of nature are marred or destroyed with a ruthlessness born of greed, the spirit of the age.

The delightful parks and glades in our mountain fastnesses, where nature runs riot in the creation of beauty and song, are made desolate for the benefit of the wool market and stock yards. The spirit, however, which prompts all this is, in the main, all right. In fact I am inclined to agree with Pope that "whatever is, is right."

It does not follow that because the commercial spirit

is uppermost and always aggressive, the esthetic quality in man is growing less. In the home we have music, pictures, poetry and about the home flowers, fruit and fragrance. We live for love, and love revels in that which soothes and pleases the mind. The grand in nature finds admiration in the souls of men, and in the contemplation of it man finds not only recreation and rest, but opportunity for study and food for dreaming. The softer sentiments wherein lie the sweetest possibliities are not in the every day struggle for lucre, but in the moments of respite, when music charms, the fragrance of flowers soothe, and the poetic sentiment springs to the spot where room is made for it.

The Switzer or Highland Scottsman tunes his harp to sing of the beauties and grandeurs of his native land. When away from it he longs to return to it, and 'tis then, when far away and homesick, memory comes to his aid. Again he revels among the hills and peaks of his nativity. 'Tis then the absent Switzer remembers that the highest Alps, the glaciers and sunken lakes make up one of the greatest assets of his native land. It is there and because of that, that thousands of pilgrims from all quarters of the globe congregate. There and for the moment the struggle for money is forgotten and the enjoyment of the sweets to be purchased with it is felt. There, is spent with lavish hand the dollars that were elsewhere sought with almost savage greed.

It is in the hours of such pleasure that the tight fisted become the openhanded, and those whose country furnishes that for which they lavishly pay, reap rich harvest from foreign coffers. To the dwellers there, the great natural wonders they have to show become assets of greatest profit. Mountain peaks and glaciers, sunken lakes and water-falls are resources, and counted as such.

These things speak a universal language and are understood by the charmed multitude, though that multitude may not understand the language of the human units that make it up.

"A motion and a spirit, that impels
All thinking things, all objects of all thought,
And rolls through all things. Therefore am I still
A lover of the meadows and the woods,
And mountains; and of all that we behold
From this green earth; of all the mighty world
Of eye and ear, both what they half create
And what perceive; well pleased to recognize

In nature and language of the sense,
The anchor of my purest thoughts, the nurse,
The guide, the guardian of my heart, and soul
Of all my moral being."

So sang Wordsworth of those subtle influences awakened in him as he he reveled in "Gods Out of Door." Every lover of nature knows what such sentiments are and how the nerves tingle with the joy of the soul; the pulsating throb of the Universe.

The millions upon millions of dollars that are annually carried out of our own county by sight-seeing pilgrims to foreign lands, are no less purchasers of the products of such lands than are those who buy of their manufactured articles and products of the soil. No country is richer in these natural wonders than our own. If such sights and scenes are resources of value there, why ought not we, with many as great and some greater, class them upon the utilitarian side in that which they bring to us from the wealth of the sightseeing, while at the same time our esthetic taste is charmed and strengthened? A whole volume would be crowded with even a meager description of the sights and scenes in our own state that are worthy of the closest attention of travelers and sight-seers.

The entry into Oregon from California by the Southern Pacific railroad—one of the most delightfully scenic roads in the world—never fails to charm, even the most phlegmatic. To climb the Siskiyou mountains and view the broad expanse of mountain billows through the gentle silvery sheen of an autumn sunlight, is a treat never to be forgotten. To sit at the car window as the train speeds along through the valleys of Oregon, and drink in the delights of an ever changing panorama, nature's own painting, encased in its framework of mountains, many of which pierce the blue vault, snow capped and pine clad, is a great treat that opens the heart and hand of the most tightfisted and so-called practical business man. The generosity thus aroused is an asset we should not ignore.

A climb to the summit of Mt. McLauglin brings enchantment in the view presented; twenty lakes are within vision, each a gem nestling in the forests that surround the base of the mighty mountain. These lakes are cold, pearly clear, and filled with trout while the forest abounds in game.

Until you have seen Crater lake your tour of sightseeing will be incomplete. It is admitted to be one of the great wonders of the world. It is unique among the

great natural wonders. It is the deepest body of fresh water with the single exception of Lake Baikal in Siberia. It is the crater of an extinct volcano, the greatest of its kind; twenty miles in circumference, four thousand feet deep, with a depth of over two thousand feet of water. Its banks tower two thousand feet above the water surface, from which they appear awe-inspiring in their grandeur. The inside dimensions at its water surface are six and a quarter by four and a quarter miles, and snow banks perpetually decorate the inner rim of the crater. There are no visible inlets or outlets to or from the lake, and the water as seen from the cliffs is in color, ultra marine, except in a few shallow places near the shore, where it changes to the deepest green. Near the west side is Wizard island, a cinder cone, the last chimney of the old volcano, standing eight hundred forty-five feet above the water with a crater in the top five hundred feet across and a hundred feet deep. Two miles east of the island the water is two thousand two hundred feet deep, making the island a mountain inside the main crater more than three thousand feet high. The crater in this island also has its banks of perpetual snow. Around the lake fragments of glaciers still cling, and evidences of glacial action outside of the rim of the great crater, together with the character of the formation, shows conclusively that where the lake now is was formerly a mountain towering, perhaps, six or eight thousand feet above its present highest pinnacle, which has been torn away and scattered over the surrounding country. Imagination is called into action with little fear of exaggeration. The lake has been stocked by the government with rainbow trout and not long ago I caught trout there that measured eighteen inches in length, and am told that it is not unusual to find them two feet long.

About the lake are many noted peaks and beautiful natural parks. The highest points are more than eight thousand feet above the sea, and the view from any one of them is magnificent. Join me while we view this panorama.

Follow the slope of the mountains toward the south along yonder canyon, until it is lost in the gloom of the forest and rocky gorge. From a dark hole in the mountain side, with many a babbling sound and musical ripple, flows Anna's creek, as if laughing in its glee at once more beholding the sunlight and mountain shadows after a turbulent journey through Plutonian darkness in its passage from Crater lake. Its course for a dozen succeeding miles

is through a romantic canyon, with vertical walls hundreds of feet high. This of course we cannot see from our perch, but we can see the course of the canyon, and where it enters Klamath valley, which is spread out below us like a map, or painting clothed in yellow and green, its broad stretches of meadow, fringed and separated by long lines of tamarack and willow, making the water courses clear and cold, a veritable fisherman's paradise. Further on is seen the shining surface of "Big" Klamath lake, bordered and fringed with its marshes of tule and Pelican Bay, the recently purchased summer home of E H Harriman, the whole incased with a framework of mountains, whose summits to the west are covered with snow, their sides clothed with dense forests of pine and fir, appearing dark blue in the distance, while high, craggy, sparsely timbered basaltic ridges rise to the east.

At the southern end of Klamath lake the mountains have dwindled in proportions and are bare of timber. Through them and having its course southward, we mark a canyon and through it we know that Link river runs, and though only a mile and a half in length, it drains an immense area of country. The Klamath Basin comprising several thousand square miles, is in plain view, and still further on Mt. Shasta pierces the blue vault 14,440 feet high, and though a hundred miles away it seems near at hand.

To the southeast skirting the mountains that lie to the east of Link River Basin, is Lost river, which further on empties into Tule lake, that silvery spot with its dark back ground of lava beds, where Canby and Thomas fell, victims of a mistaken policy in the war with Captain Jack, the renegade Modoc chief. Just below us only twenty miles away and plainly seen on the bank of Wood river is old Fort Klamath where Captain Jack and three of his murderous companions were hanged in October 1873. I witnessed the execution and on the next day made my first vist to Crater lake thirty-five years ago. From our stand on the brink of this great abyss we now turn to the east and obtain a wonderful expanse of vision. The "Great Oregon desert" is in view, with Steins mountains beyond it, where Chief Moses toyed with Uncle Sam's wavering policies during the war of 1878 and 1879. To the northeast, Bear creek buttes rear their heads six thousand feet above sea level, and mark, practically the geographical center of Oregon. To the north Diamond peak and the Three Sisters may be seen along the fracture line of the Cascades, marking

spots once energetic in volcanic action. To the west we may trace the coast range for many a mile. To the southwest Mt. McLaughlin shines like burnished steel in the sunlight only thirty miles away, while still beyond it the rugged Siskiyous add still further grandeur to the view and fragments of Rogue River valley are thrown into the picture by way of decoration. In short we are standing on a pivot upon which we may turn and have within the scope of our vision thousands of square miles of territory, embracing mountain and plain, hill and vale, desert lands and garden spots, lakes and rivers, winter and summer and spots that are bloody pages in the history of Oregon and California. Here we are standing on the very spot where the most violent volcanic action occurred during that period when an expansion of the continent was wresting our Old Island from its lonely environment of ocean, and bringing to the sunlight an empire of the west; here nature thundered her loudest acclaims when Oregon was born.

Neither time nor the purpose of this little volume will permit extended particular description of the many interesting sights to be found in Oregon, which is varied beyond conception in the richness of its many scenic wonders. Perhaps in another volume I may attempt to depict in proper phrase the Columbia that rolls its billows to the sea; Hood, the queen of mountains; Jefferson, the Three Sisters, Diamond peak, and the thousands of sights hidden away in the Cascades, Coast range and Blue mountains with their valleys between. We have yet much to explore in the Old Island. I can not, however, resist the temptation of a little further digression.

The present and the future generations owe and will owe, a debt of gratitude to the projectors of the great Cascade forest reserve, and to them will fall the sacred duty of preserving it in the interest of the public. There we may go for health, for recreation and pleasure. These great forest reserves constitute a substantial resource that will not be exhausted by a proper use of them.

In his book entitled "The Mountains of California," John Muir has dedicated one of the finest tributes to nature that has ever been written. He has not written rhyme, but every page is a poem. No one can read what he says, if the reader has a spark of love of nature in him—and most people have, though it may be latent—without being carried out of himself, out of his human surroundings and into that realm of beauty which only requires a little exper-

ience to make a genuine enthusiastic. There is no recreation that so strengthens the physical and at the same time elevates, ennobles and charms, as that of mountain climbing. Those who have been denied the privilege from any cause have not filled out the possibilities of their conceptions of intricate variety in the beauties of nature. To wander alone in the mountain forests and listen to the crooning of nature's nymphs is to love that solitude for the company it furnishes. To watch the destructive cyclone on the broad plains of the Mississippi valley, or even to read of it, arouses a feeling of terror of the dread forces of winds run wild; but to listen to the gentleness of these same winds tuned to the musical instruments nature has provided in the pine tops, is to lapse into a sense of security, with every nerve responsive to the music they make.

Who that has sought the higher mountains has not been conscious of the stillness with both music and incense in it; the gentle rustling of the pine needles, the tremulous movements of boughs and branches, the sullen soughing of the winds in the higher passes, the gentle lullaby of a neighboring rill, or the rush and roar of some cataract the ever present perfume of the myriads of plants and flowers and resins, forces a conception of nature's cathedral, where praises are sung and incense is offered up to the mighty and unseen forces that have built up these massive piles.

Those who live in the immediate vicinity of the grandest of mountain scenery, by their very familiarity of nearness, are often most ignorant of the beauties and benefits, and seem contented if the localities are within the line of vision and feel no desire, or curiosity for nearer investigation. Man builds great sanitariums for the recuperation of the votaries of fashion, whose leisure has been misspent in the atmosphere of pestilence and bad breath, and who name these places "health resorts." The change is simply from one kind of dissipation to another; instead of building up wasted tissue, they pull down that which has suffered least, to keep company with that which has suffered more. It is said that "the lowest valleys and the highest hilltops were the Masons' first Lodge room," and that the "groves were God's first temples." It may now be truthfully said, as a rule, that the lowest valleys are the haunts of men, and where you find the densest population you will also find that the mental, physical and morals of humanity suffers most. Wickedness seeks the

multitude, and the multitude grows more wicked from the contact. That is called artificial which is the result of human ingenuity, and human ingenuity is bent to its greatest effort to pander to the passions of men and women, because it pays best in money. He who seeks the solititude of the mountain for the love of it, parts company with avarice and wickedness at least for the time, and revels among the virgin beauties of nature, fresh from the hands of nature's God. The great book is here opened to him, and as he views it all in wonder and wrapped admiration, he feels inclined to enlarge upon Pope, and to say "the greatest study of man is Nature." There is no question that the study of man is a great and proper study, but to study him to the exclusion of the other great lessons that the Creator has spread out around us in Nature, is to misconstrue and restrict some of the strongest evidences of a great and over-ruling power, whose law is nature, and whose records are the rocks, the hills and the valleys. The instruments with which these records are written are the elements of nature with which we must reckon in our study. We cannot neglect these in our study of mankind. The eternal principles of evolution are everywhere vouched for and emphasized. No one will seriously find fault with the hope that after this life a new page will be opened to humanity. None will seriously wish to believe that this life is not a steppingstone to a better one. It seems to me consistent with such a wish and such a hope that, if in the other life we are to be graded and assigned by any rule, or standard, it must in a measure depend on our study and appreciation of nature as it is here opened out.

To whatever we may be indebted for the life present and to come, we are also indebted for that which gives us genuine pleasure in this life, and that pleasure depends largely upon our study, understanding of and adaptation to the conditions we find in the material world about us. We grow tired of darkness and wish for the sunshine. We are not satisfied with music, nor sermons, nor any other one thing. We appropriate to our use the infinite variety and details that belong to the material mass without stopping to think of the relations we bear to them, or they to each other. We do not stop to study these relations and have no conception of the beauties and startling surprises in store for the student of nature, who of all others can fully understand such impaired passages as have been written by Wordsworth, Byron and other poets who have gone out of the herds of humanity into the majesty

of untamed nature and there, forgetting the age, have opened and read the great book. Such as they, can appreciate the beauties of Muir's descriptions and are made better by the change of companionship. Byron says:

> There's pleasure in the pathless woods
> There is beauty on the lonely shore.
> There is society where none intrude
> By the deep sea, and music in its roar.
> I love man not the less, but nature more,
> From these, my wanderings * * *

To understand well is to observe closely; and how many do so observe? Read Muir's description of the Douglas squirrel and whether you have ever seen this little animal or not, you will be conscious of following one whose whole soul is in his study, and who has not lost sight of the slightest detail. To one who has closely watched this little bundle of sunshine and muscle, comes the delight of seeing him again in his native haunts. So delightfully complete is the description that you hear his chatter; you can see the majesty of the forest where he makes his home; you smell the odors of the pine woods and the balsam of the firs; the fragrance of the flowers and grasses delight your senses; every pine needle and cluster of leafy foliage varies the monotony of a steady sunlight and carries to you so soothingly the music of movement and murmur, that every chord of a healthy being becomes responsive to the melody.

Whatever may be our conception of the Creator we are here nearest to Him, and as we tune our souls to harmony with such environment we come into closer contact with the Creator and His creation, "He in us and we in Him", part and parcel of harmonious whole in which is no discord, except in man's egotism or selfishness he makes it. He who seeks the grove finds there the Temple. He climbs to the mountain top and as he stands there and feasts his soul on the grandeur and beauty that is spread out around and below him, his consciousness is more than admiration; it is reverence in the presence of an unseen and mighty power, and his sentiment is that of adoration for the author of it. It needs not the weak devices of humanity to direct his attention; human devices are not needed for such a sermon—a veritable "Sermon on the Mount." Nature sings her own songs; the poet calls it the "music of the spheres."

In the presence of matured nature the old grow young

again, moral and physical miasmas are left behind in the haunts of men. The grateful shade, the leaping and singing of the water, fresh from nature's fountain, sparkling and bright as the dew-drops of the morning, invite to restful repose, while the fragrance of nature steals away the senses, and the sweets of unhaunted dream-land make an Elysium of her own combinations. Here, then is the sanatorium that meets every requirement, fills every want, where is built up every tissue; here the mental, physical and moral receives each its proper treatment. Such a book speaks a universal language. No translation or revision is required. It makes no difference what tongue is spoken by the auditor, nor whether he be educated or ignorant, savage or civilized, he can read for himself, and if he will study the book he will gain understanding from it. It is the book of books, nature itself, written by the author of all, and furnishing the text and substance of every other book. Why, then is he who admires it most, seeks it, studies it, and adores the author of it not a consistent worshiper, and pleasing in the sight of its Creator and his.

He who makes the roses grow, where before was a bleak hillside or barren spot, is a worker in the Father's vineyard. He who studies nature and improves the quality of fruit is a public benefactor, and draws his inspiration from the book. There is a voice crying in the wilderness that rustles the leaves in the tree tops. The birds mingle their melody with the fragrance of the flowers, ferns and grasses. There all is life, activity and joyous freedom, so delightfully blended as to make up the most harmonious whole. Man alone is a breeder of discord in his scramble with man. There are too many teachers among the creatures, with little thought of the lessons of harmony taught in the book of nature.

Chapter. VIII.

A MORE PARTICULAR EXAMINATION OF THE SISKIYOUS.

"Here I and the beasts of the desert agree,
Mankind are the wolves that I fear,
They grudge me my natural right to be free,
But nobody questions it here."—(Cowper).

In the preceding chapters we have devoted the space in proof of the insular character of the Siskiyou mountains in pre-historic times. We have shown that it is one of the oldest pieces of terra firma among the continents of today. We will naturally expect to see a very material difference in its rocks, minerals and soils, from the country we have been exploiting, though we find the two abutting upon each other.

We have discovered that the mineral wealth for which northwestern California and southwestern Oregon have been noted since the earliest settlement of this west coast, is found in and around the Old Island. We have discovered that the Siskiyou mountains afford a watershed with its axis almost corresponding with the line that separates these two states, turning the water to the north and south, and that the axis of the Siskiyou range is east and west, which is at right angles with the usual trend of the mountain ranges of the continent. We have discovered that the climate of the region affected by this old mountain island is different from that to be found elsewhere. It now rests with us to make a closer examination of that part of the interior of the old island embraced within the limits of the Siskiyou range, and to make a closer scrutiny of this ancient land. I have mentioned the geological assignment of the island to the cretaceous period; the word cretaceous means chalky, and relates to a formation of so distinctive a character, as to give its name to that period during which it was formed. In fact we do not know how long before that period the mass of the island was formed, but that it was here as a large body before the cretaceous fossils, we are sure, for we find them in the sandstone that laps up on its old shore. I do not intend to enter into a geological discussion further than to assure an understanding of what is to follow. From the term "chalk", it is not to be understood that this formation consists wholly of that article known to commerce and the school

room as "chalk" and called by that name. It consists of chalky matter sometimes with flints, sometimes with marl, sometimes with neither and frequently merging into various kinds of limestone, intermixed with sandstone filled with shells and other fossil remains of that period, particularly crustaceans, the shelly covering of whose bodies, being of a limy character, enters into the limestone formations peculiar to that period to which this section is assigned. Within the Old Island are extensive limestone caverns, of an older date than the cretaceous. These caverns and marble halls are of great extent and to the description of which a chapter will be given further on. Suffice it to say at this time, that it is generally understood that the larger caves and caverns of the earth are to be found in limestone formation, though not wholly or necessarily so. For instance the picturesque cave of Fingal, in Staffa, is in basalt, and in many places modern lava contains caverns of great extent. Rock salt and other formations susceptible to the action of water, form many interesting and beautiful caverns. Professor Liebig in explaining the formation of stalactites and stalagmites, has suggested that agency which rapidly forms caverns in limestone, by the action of water charged with carbonic acid gas. The mold of a superficial soil being acted on by moisture and air, evolves carbonic acid which is dissolved by rain. The rain water thus charged, permeating the calcareous strata, has the power of taking up a portion of lime, which it retains in solution and carries along with it, until evaporation has discharged the excess of carbonic acid, when the lime is precipitated, and if in a cavern many fantastic shapes are formed; or if the stream still charged reaches the open air the lime will be deposited along its bed and shores, incrusting the banks and clinging to the roots of trees and other objects that afford it a resting place. Some of my readers will recall from memory the existence of such streams and such deposits that have come under their own observation. Often these cretaceous deposits have been formed at the bottom of the ocean, in thin horizontal strata, consisting chiefly of microscopic shells. Such deposits more generally resemble chalk than ordinary limestone. Now if such a sea bottom should become dry land and then be subjected to volcanic action which would break it up and change the position of its broken parts from horizontal to vertical, or to any angle away from horizontal, a character of formation would be exhibited exactly like that now to be seen in the vicinity of the old mines two or three miles

below Ashland and at many other points about this Old Island. Again, if such cretaceous deposits be formed in the deep depressions of the sea, they will have greater thickness and may reach hundreds, or even thousands of feet in depth. Such deposits may now be seen along the line of the Grand canyon of the Colorado that were once at the bed of the sea and have been elevated and crumpled in the course of the contraction of the earth; cross sections are exhibited where the stream has cut through them making it possible to measure the depth of the deposits. This great natural wonder has been most delightfully explained and described by Captain C. E. Dutton of the United States Geological department.

Now let us suppose this old sea bed to have been slowly uplifted until it became dry land and after many ages of exposure, and the changes consequent upon sunshine and shadow, rain and drouth, heat and cold, volcanic action and metamorphic effect, this deposit is pierced by some subterranean convulsion, of which steam furnishes the chief force, and this followed by fitful outbursts of water heated as only subterranean fires or nature's chemistry can do it, and we will have this great mass of matter boiling and bubbling, rising and falling, and becoming more and more mixed with the wreckage of greater depths, the whole seething mass carrying with it, not its original character but a new one, a mush and mud boiling over its sides; aqueous and igneous matter inextricably mixed, porphyry, iron, spar, cinnabar; gold, silver and what-not, ground in the mills of Vulcan, mixed and boiled with the deposits of the ocean, a pot of porridge fit to feed the internal forces that have shaken the earth with convulsions since that poetic morn when "the stars sang together."

Such a mixed mass of matter may be seen but a short distance below Ashland, at what is known as the "49 diggins." These old geysers and mud volcanos, at one time held high carnival at many places about this Old Island when the waters of the Pacific washed the foot of the Rocky mountains, and a roaring surf lashed a lonely shore where Ashland now stands, while at or toward the interior of the island, lurid flames belched forth from lofty mountains, marking this a veritable Terra Del Fuego. Uncountable ages before Crater lake became the mightiest hole-in-the-ground, before the Cascade mountains arose above the surface of the waters, when only a portion of the Sierra Nevada mountains had reflected the rays of the sun, while yet a great part of the continent of Europe was

sleeping beneath the waves and long before man came to inhabit the earth, a mighty volcano was in operation near where Ashland creek has its source, and there rained down on the spot where we now live a greater storm of ashes and stones than sealed the fate of Herculaneum and Pompeii, while all about the foot of this great fiery mountain, in clusters and groups, bubbled and boiled these geysers and mud volcanos, the Devil's porridge-makers, where men now for the love of money, are digging and delving for gold. The leviathans of the deep, the like of which we have not now, either on land or in the sea, but the bones of which we find preserved in the sand and lime of that ancient day, then fought their titanic battles where are now villages and towns, farms and orchards.

That there has been an immense erosion of this Old Island is very evident, and perhaps a great part of the four thousand feet of sediment that makes up the mass of Grizzly mountain came from the Siskiyous. On Wagner butte at an altitude of nearly seven thousand and about eight miles southwest of Ashland, is a considerable fragment of marble. Westerly along the Siskiyou mountains at various elevations, on the tops of high ridges are extensive bodies of beautiful marble. We find it on the mountains that border the Applegate and Williams Creek valleys. On Chaney creek about twelve miles southwest of Grants Pass these marble beds are of considerable extent. Much of it is of fine quality, and in Chaney creek district are extensive caves formed in them. Some of these beds have gone in to the ownership of private parties and are being utilized in the manufacture of lime, in the character of which it excels. Further on to the south and southwest, in the southern part of Josephine county and reaching to the California line these limestone beds are found high up in the mountains, usually occupying the tops of the ridges.

This display of limestone, which in places has become marble by metamorphism, tells its own story. It too was deposited at the bed of the ocean and like the Cascade mountains, was slowly raised above the surface, crumpled, folded and broken, until now we find it a part of this great mountain mass. There are evidences that indicate that the country to the north and east of the Old Island was above the water at a much earlier period and that it subsided and at a later epoch was elevated above the water as we now see it. It is a query then, whether that earlier subsidence occurred at the time of the elevation of the Siskiyous. A discussion of this interesting subject how-

ever, we cannot take up, for as before suggested it would lead us too far afield for our present purpose. There is no great doubt that when this limestone bed first came above the surface it extended as a continuous mass, an unbroken field of limestone, hundreds, and probably thousands of feet thick, and covered hundreds, if not thousands of square miles of area. Now only fragments are left on the ridges, and great gulches and canyons have been washed through it, until as above stated we only find fragments left on the tops of the high ridges that separate profound canyons. Some of these beds now cover many miles of area and in places are as much as two thousand feet thick. The bedding is a bluish slate, probably the slime of the ocean floor where it was deposited. This bedding may be seen where erosion has laid it bare, sometimes a thousand feet above the bed of the canyon. It is quite evident that the greater part of this deposit has been worn away and gone to enrich the soils of the valleys that lie at the feet of these mountains, or have been returned to the ocean for further refinement and distribution. To stand on a summit of any of the prominent heights of the Siskiyous and look about and below at the magnitude and depth of these canyons, and try to conjure the length of time required to remove the incalculable quantity of material necessary is confusing. As said before the great mass of these mountains seems to be granite, which is classed as an intrusive, igneous rock, that doubtless forced its way to the surface through great depths of sediment which, since that time has almost wholly disappeared. Everywhere these mountains are seamed and scarred with ledges and dykes—quartz ledges that in many places are rich in gold, copper and other minerals. These ledges during the unnumbered ages since they were filled, have suffered erosion and been broken and scattered, spreading their fragments as gold mixed gravels around the old shore-line. Some of these are known as "pocket ledges," for the reason that the gold is found in them in spots and bunches, while between the bunches, or pockets, the ledges are barren. Pocket ledges are sometimes very rich, the bunches being large and with little rock, or other foreign matter being mixed with the gold. The breaking up of such ledges assure rich placers of coarse gold. The "nuggets" come from these "pocket ledges." There are but a few of the hundreds of streams of the Siskiyous that have not furnished placer mines of varying richness. Thirty miles south of Jacksonville, almost on the summit of the old

island, operations are now being pushed in the development of extensive copper deposits. Good roads have been built at heavy expense and much enthusiasm is being evinced at the prospect of the opening of these mines. Further west high up in the mountains, other copper properties are being operated or opened. In the extreme southern part of Josephine county a smelter has been in operation for the past three years and the developmnt of many locations is being pushed forward as rapidly as men and money can accomplish the work. The development of gold quartz mining is a great and growing industry, and the use of electricity for power has added an impetus to the exploitation of the mineral resources of the Old Island. Further to the west nearer to the coast, chrome, carrying a considerable percentage of silver, is plentiful and with facilities for shipment will become a great industry.

The coal mines of Coos are within the Old Island and have been extensively operated for fifty years. Situated on Coos bay, one of the best harbors on the coast, they need no better facilities for shipping their product and great markets are open to them. Asbestos, graphite, kaolin and fire clay are found in many places and cinnabar promises an important source of revenue. Few countries furnish finer building stone than the granite, sandstone, marble and coarser limestone found in abundance about the Siskiyous. In addition to all this mineral wealth, these prehistoric time-scarred veterans, are clothed in world renowned forests of pine, fir, cedar, spruce, laurel, maple, myrtle, ash and many other varieties of the finest timber, and the government is wisely guarding them from vandalism and waste. The Port Orford cedar is, perhaps the finest of its kind in the world. I have no information that it is found anywhere outside of Coos, Curry, Josephine and Douglas counties and it brings fancy prices in all markets. It is gigantic in size, sometimes reaching a diameter of sixteen feet and one hundred and fifty feet without a knot or a limb. If this royal wood existed elsewhere it is almost extinct. The sugar pine and red and yellow fir also excel of their kind. The Forestry Exhibit at the Lewis and Clark exposition, coming from Coos county could not have been excelled. Some of that exhibit may still be seen at the Forestry building at Portland, which has been preserved. There are great quantities of lesser growth, all of which differ in some respects from that of similar species elsewhere, and of smaller growths that are not found anywhere else. Were I a botanist I am sure that

I would revel in the study of the flora of this region. The variety of flowers and flowering shrubs to be found is interesting almost to confusion. The bright colored manzanita is everywhere and in size and beauty it excels. The flowers of this bush are of various tints of pink and red, and very fragrant and good bee food. To the honey manufactured from the manzanita there is a fragrance and flavor that is unique and that adds to its quality. Every canyon has its dog-wood with great white blossoms, its yew with dense, fragrant foliage, madrone with its bright, smooth shiny bark and great broad leaves that look like they were heavily varnished, and in season, beautiful red berries. The Oregon grape that has been adopted as the state shrub, reaches perfection in the Siskiyou mountains. Its leaves are holly-shaped, bordered with sharp spines, thick, glossy and highly polished on the upper side. The stem of this shrub grows some times six or eight feet high and is not a vine as its name might imply to the uninitiated. It has flowers that grow in long clusters and are a brilliant orange color. Few plants are more highly decorative than the Oregon grape. Its berries when ripe are in clusters corresponding with the bloom, are a beautiful purple, about the size of a buckshot and very firm and sour. Mountain lilies grow to perfection and when in bloom shed their fragrance with great power. They grow on stalks sometimes seven to eight feet high and will bear from half a dozen to fifty blooms on a single stalk. Sometimes acres of the mountains will have hundreds of these stalks to the acre, adding an indescribable charm to the landscape, the great white blooms throwing off fragrance that can be detected for half a mile when they grow in abundance and the wind is fair. Everywhere that there is soil there are flowers of some kind, sometimes so small that they will be overlooked unless under the closest inspection. On the highest points, and almost against the snow banks, these beautiful little reflecters of sunshine decorate the ground As you go higher, the form and character of the shrubs and flowers change and that to be found at six to eight thousand feet, while sometimes resembling those lower down, in some respects will be found entirely different. Tiger lilies are frequent in the canyons. Maple, alder and ash, form the most inviting shade in little nooks by the roystering stream, hidden away in the deepest canyons.

The mountain sides sloping to the north are clad in the everpresent pine, fir, spruce and hemlock. The sugar pine with its short needles, long cones and stubby branches,

can be identified miles away. Some of these trees will measure eight feet in diameter and be a hundred feet without a limb. The yellow pine is not less characteristic; its needles are longer, its cones shorter, its branches more symmetrical and the bright yellow of its bark distinguishes it at a glance. It too grows to great size with clean, beautiful trunk. The red or Douglas fir seems to be especially adapted to these mountains, massive, firm and beautiful, reaching a heigh often of two hundred feet and a girth of twenty or more. The Douglas fir is one of the most valuable of our forest products; it has great strength and is a very firm and lasting timber. The white fir is a beautiful tree, tall straight and symmetrical, but not long lived, as a rule, though specimens of great size and age are met with. Its foliage is very beautiful and glossy and the bark white, and in the young trees smooth. This timber when young is sometimes called "balsam," because of the quantity of fir balsam that exudes from it. As a commercial timber it is less valuable than the others. It is very heavy when green and light when thoroughly seasoned. It is not a lasting timber and has a tendency, like cottonwood, to warp and twist if left to the weather. It is valuable for boxes and for some kind of inside finishing and in the manufacture of paper. In some localities there is a good quality of red cedar, but as a rule this class of cedar is subject to a kind of dry rot. The myrtle, maple and white cedar burl (found chiefly in Coos and Curry counties), are very valuable for furniture and is fine finishing lumber. Nothing is more beautiful than the variegated myrtle, the birdseye maple and the cedar burl, all of which take a splendid polish and are extensively used for veneers. The myrtle, however, only grows to perfection on the streams along the slopes facing the ocean. They grow on rich bottom lands of great agricultural value that are being cleared up and the myrtle is being destroyed as was done with the walnut of the Mississippi valley in the early days there. The future will suffer great loss when this splendid timber shall have been wasted as is being done. Along the coast spruce abounds and is extensively used in the manufacture of tubs, buckets, crates and firkins; it is also valuable for paper pulp. Alder, cottonwood, quaking asp and hazel are also plentiful along the streams. The hazel grows to mammoth proportions, often thirty feet high and two to six inches in diameter. I have seen elder growing to be twelve and fifteen inches in diameter. (The reader must not confuse 'elder' with 'alder.'

In the fall of the year when all nature is preparing for the winter, a trip through these mountains furnishes a greater variety of startling and wholesome delights than anything else.

"Autumn laying here and there
Its fiery finger on the leaves,"

touches off the scene with a warmth and glow of coloring, unequalled in the whole catalogue of artificial delights prepared for occasions. I will devote a chapter to the subtler influences to be found in these mountains, where, if there is any poetry in the adventurer's soul, he can find enchantment. In the following chapter we will climb the heights and enjoy the panorama.

Chapter IX.

A RAMBLE THROUGH AND OVER THE SISKIYOUS.

"What if earth
Be but the shadow of Heaven, and things therein
Each to the other like more than on the earth is thought"

Having selected Ashland as the place from which our explorations of the Old Island may be best prosecuted we will again make it our starting point; this time for a ramble over the Siskiyous.

We will assume it to be the month of July and Chautauqua season. In this little city, christened by admiring strangers, "Ashland the beautiful," a thousand strangers are gathered for recreation and pleasure, and the enjoyment of a "feast of reason and a flow of soul" that characterizes this annual assemblage of Chautauquans.

In the Chautauqua park are gathered both old and young—some chatting, some reading and some sleeping away a half-holiday, but all free from care the while. Through this beautiful park runs Ashland creek, which has its birth in the snow banks of Ashland butte, ten miles away. Looking up stream we catch glimpses of the distant snow banks and are impelled toward them. Everywhere we see the stream thro' dense foliage, laughing, leaping and singing, or resting in a pellucid pool, joyous in reflecting in detail the decorative borders that surround it, then rushing away again for a moment's flash and sparkle in the sunlight.

After half a mile has been traversed the valley becomes a canyon; the mountains come closer in, as though to hear more distinctly the musical message that the rushing stream is bringing from the snow bank. Our road following the sinuosities of the stream makes a turn about a jutting point and we find ourselves under "Hanging Rock," a great granite boulder perched above the roadway. Turning to the right we enter a dense shade of maple, alder and yew. Just below, a couple of barefoot boys are angling for trout and catching them, as the speckled beauties in their basket prove. A little further on we pass "Echo Rock," which at first startles the stranger with the thought that behind this granite palisade is another torrent. We discover our mistake and good humoredly submit to be

laughed at by the merrymaking messenger, that has only played us a little joke. We climb a rugged point while our stream sings merrily on below us. Every few rods are inviting and romantic nooks where the sunshine is filtered through a dense and variegated foliage, casting a sheen as from a gorgeous cathedral window. Here the maple, alder, yew, madrone, cedar and many other species of growths cover mossy mats on sloping banks, inviting to repose. A water ousel dips into the spray for a moment, then perches on a rock in mid-stream and nods and jerks his little body as though making obeisance to his holiday visitors. A Douglas squirrel springs up, like a little bundle of sunshine and muscle, and flashing his saucy tail in defiance scampers up a fir tree and chatters and scolds at us from its branches. A covey of mountain quail in topknot and gay garb, flutter and are gone among the grasses. A mountain lily, the queen of mountain flora, nods above us and scatters here fragrance in reckless extravagance.

A little further on we reach the "Shut In," the site of the head-works of Ashland's splendid water system and municipal lighting plant. Here massive walls of granite tower above us leaving only room for the road bed and the stream which plunges down a rocky defile with a rush and a roar, raising a spray that feeds the beautiful maiden-hair ferns and other clinging growths that find precarious footing on these rugged granite walls. We notice how different the formation is from that of Grizzly and the Cascades. There it was shale, gravel, sandstone and boulder cliffs with the inevitable capping of basaltic lava. Here it is granite, granite everywhere. Granite boulders in the stream, granite cliffs towering high above us, and erosion bringing granite sand and soil into the canyon and filling the crevices and fissures among the rocks.

We follow the sinuosities of the stream for a mile further and come to "the Falls," and are now in "Ashland Park", a water and timber preserve of many thousand acres, in the heart of the Siskiyou mountains. This park has been set aside by the Government—an act of paternal thoughtfulness that gives assurance that we are progressing in a very important matter.

We are now well into the mountains and four miles from town. Here the stream forks, one branch coming from Ashland butte, the other from Wagner butte. The beautiful falls of the one and the no less delightful cascades of the other, a few rods above the junction; the dense shade, the pools of crystal, ice-cold water, the variety of

foliage, the chattering of chipmunks and scolding of squirrels, the confused mingling of fragrance from the dense and varied foliage, make this an ideal spot for a summer's day picnic.

From this point our road bears up the Wagner creek branch of the stream for two and a half miles further and there comes to an end. From this on to the summit is a reasonably good trail recently greatly improved by the forestry service, which has also established a telephone line from Ashland to the summit of the mountain. Everywhere along the stream the characteristics before described are repeated and multiplied. The mountains grow higher and steeper, the canyon more rugged and deeper and the stream more rapid and turbulent. Six miles from Ashland we reach the end of the wagon road which however, the forestry service has undertaken to extend, perhaps to the summit near the top of Ashland butte. We now begin a steeper climb over the winding and zig zag trail six miles further ere we reach our goal. Many splendid views are obtained as we wind our sinuous course around the side of the mountain climbing higher and higher above the bed of the canyon. Wagner butte rises to a height of over seven thousand feet and is just to the right and only five miles to the top. Winding along sometimes in the timber and anon along the brushy hill side until we reach the top of a long ridge that comes directly down from Ashland butte which looms up grandly and near by and are on the summit of the Siskiyous. For the last two or three miles we have followed the axis of a long ridge from which we looked down into a deep canyon to the east and west. We heard the plunging cataracts below us but could not see them. We observed the timber of splendid growth and of the varieties heretofore described. Our way along this ridge has been gently upward through inspiring forests and grassy glades. The grass is very luxuriant and being in a government water preserve is protected from pasturage.

We have reached a region of rarified air and find the shade and grassy mats most delightful places of repose. One cannot travel fast nor far in these altitudes without stopping for breath, but a more delightful place for leisurely sauntering on a bright summer's day could not well be found. Here imagination will run riot if one has any. If one has poetry in his soul it will come to the top, and for psychological reverie and daydreaming here are many ideal spots. The poetry and dream-inducing effect however, I

will try to give in a subsequent chapter. In this little volume it is my desire to give some portion of the esthetic as well as the utilitarian. The poetry of the situation is no less sought for by the investigator and constitutes one of the greatest charms and attractions of this Old Island. They come in as decorations and embellishments to a region which is greatly varied in its material resources and the advantages offered to the miner, farmer, horticulturist, stock-raiser and lumberman, all of whom find here spots for their vocation rarely equalled, and as a side study man's relation to material things.

Having reached the top we gaze about in delight. Just to the east of us only a half mile away and a thousand feet above, is the summit of Ashland butte, one of the highest points of the Old Island. We will reserve for a subsequent chapter a climb to the top of it and will take our course toward the west along the main summit of the range. There is a wonderful expanse of mountain billows and valleys in view, but we will first deal with other features. Starting at our feet and flowing away southerly is a rivulet which a few miles down the mountain becomes a roaring torrent where very extensive mining was carried on in the early days and is still pursued to a considerable extent. It is known as the Grouse creek, Beaver creek and Hungry creek mining region and begins down the slope from us five or six miles away and is chiefly just across the line in California. The slope is steep and cut up with canyons and gulches. Where we are there is an occasional weather-beaten tree, gnarly, warped, scraggy and stunted, for the winter storms are very severe here and are liable to come any month in the year. Snow banks near by show its lingering hold into mid summer and in places throughout the year. Large areas of the southerly slope are barren of timber, or possess it only in patches and grooves, but everywhere grass is luxuriant, even to the very edge of the snow banks, giving a beautiful park-like appearance. Further down the timber begins in broad forests of pine, fir and cedar and along the streams are the growths elsewhere described. All of this we can see with distinctness, and so thick and dense are the trees that they seem to be piled one upon the other. At the foot of the slope and twelve or fifteen miles away, with the use of a glass we can see patches of the silvery surface of the Klamath river into which all of these streams flow.

I have already spoken of the importance of this river in the mining business of California. The stream is mined

by means of wing-dams thrown out from one bank or the other, sometimes to near the channel, which turns the water toward the opposite bank, then pumps are placed into the parts enclosed, a large wheel is rigged just outside of the dam where the current is strongest and so placed that the stream, striking the buckets at the bottom of the wheel turns it and develops large power, sufficient to operate pumps derricks, etc. The water must not only be pumped out of the space enclosed in the dam, but water must also be raised to the sluices, which are placed above the ground being mined, and the gravel and dirt elevated and dumped into them. Many of the boulders are very large, requiring strong derricks to move them and even then sometimes they have to be reduced by blasting before they can be handled. Often several wheels are required to generate the necessary power for operation of these channel claims. In many places they have to remove as much as sixty feet of boulders, gravel and sand before the bed-rock is reached where the chief pay is found. These claims can only be operated in the summer months when the water is at its lowest; from all of which it will be readily seen that mining in the Klamath river is no small undertaking. It requires many thousand dollars to "rig up" such a mine and many men, working by shifts day and night as long as the season lasts. Sometimes immense sums are taken out of these river claims in a season and again money is lost on the venture. Almost every bar on the Klamath river from the time that stream has entered the Old Island to the ocean has been worked over, in some instances more than once. Many of the best bars lay outside of the channel, and were per consequence more easily and cheaply worked. Since the early mining days there have been many millions taken from the Klamath river bars, and still they are being operated every year. Streams enter it from both the north and south, practically all of which have been mined from their sources to where the river receives them. Until a few years ago the mining of all this region was placer work, performed by the various methods then in vogue, but in recent years quartz mining is being rapidly developed. This old mountain has been seamed and scarred most unmercifully in every direction by intrusive dykes and ledges of quartz and porphyry, all of which contain more or less gold and some of them are very rich. The erosion of this old mountain which I have already described has torn off the tops of these ledges and dykes and washed the contents into the streams and rivers carrying the gold,

which being heavier than the other sediments sinks to the bottom where, in streams it is found on the bed-rock. This is also true of many glades and lines of old water courses from which the water has been diverted by changes in the slopes. In such places, often near the tops of high ridges may be found heavy deposits of old sediments with great depths of rich gravel. Sometimes this deposit will pay from the surface down, but as a rule the best pay is on the bed-rock. Sometimes these gravels are as much as fifty feet or more in depth and if water is available are worked by hydraulic.

Standing on the summit of this mountain as we are supposed to be, we are looking over many hundreds of miles of the finest forests and mining territory on the continent, whether looking southerly into California or northerly into Oregon. The line dividing the two states is only about four miles south of our look-out at this summit. What I have said about the mines along the Klamath river will also apply to the mining along the Applegate and Rogue rivers on the northern slope, except that there has not been as much wing-damming used in the last mentioned streams. All of these streams get their wealth from this old mountain.

Pursuing our course now to the west along the main divide we will find a reasonably good trail following the ridge. The way is open and grass covered, with occasional scraggy timber. The slopes break down at a sharp angle on either hand, the streams flowing northerly to Rogue river and southerly to the Klamath. The going is fine and the view grand from almost every part of the way. The dense forest covers all of the northern slope and large areas of the southern. To one familiar with the country a descent of a few miles to right or left would bring such trout fishing as would make any angler shout with delight. Occasionally we come into a glade and surprise deer quietly feeding, for they frequent the higher ridges during the summer. If it be in the middle of the day we will occasionally hear them scampering off as we enter a clump of trees, and find where they have been enjoying their midday siesta under the shade of the heavy branched larch that grows in rank and dense clusters near the higher summits. There are few places to be found where the shade is so inviting, the ground so luxuriously carpeted with cast off foliage and the breezes so laden with the odor of balsams and fragrant vegetation, as in these beautiful bowers. There is a freshness and a quality to the at-

mosphere that is most enjoyable and is entirely wanting in the valleys below. Pursuing our course still to the west for about six miles we come to the "Big Red mountain," so called from the distinctly reddish cast of its formation. It is perhaps seven thousand feet high, with rugged peaks, pinnacles and high cliffs where one may sit and look into dizzy depths almost directly below him. This eminence is three or four miles long and seems entirely distinct in its character from the main granite mass of the Siskiyous of which it is a part. It is largely of serpentine and about it are found fine prospects of cinnabar, where a number of claims have been taken and considerable development work has been done. This old mountain breaks abruptly down to Beaver creek at the south and is a delightfully grassy slope almost to the stream a mile away. If one were out for pastime and a summer outing a finer place for a week's indulgence in hunting and fishing could not be found than on the banks of Beaver a couple of miles below the summit of Red mountain. No better place could be wished for and the stream for all that goes to make up a romantic seclusion cannot be excelled. There in the depth of one of the grandest canyons—not a rough rocky gorge, but a canyon with long steeply sloping sides, smooth and densely timbered—is a clear, leaping, plunging stream of ice-cold water, with myriads of trout reaching fifteen inches in length, banks shaded with maple, alder, ash, yew and willow, and here and there deep, broad pools to which you work your way and into which you cast your hook with assurance of fish. There are no roads within ten miles of this place and the ordinary fisherman never finds it, hence it has not been fished out nor its wildness impaired by the vandal. I recall two weeks that with one companion I camped there and fished, and prospected and waxed fat. What a glory and joy of life in such a place, away from care and turmoil, living under the trees, fishing when one feels like it, eating when one feels like it, sleeping when he feels like it and doing whatever he wishes when he feels like it. How I enjoyed lying under the trees listening to the stream murmur and the squirrels scold and speculating upon that time in the past when this was an island with no land in sight from its highest point off to sea. Further down the stream a few miles are the deserted mines where men swarmed and sweated and swore in the early mining days, mines now all but obliterated. An occasional prospect hole or foundation where a miner's cabin stood, or the line of an old mining ditch almost lost in the jungle

is all that is left to tell of the toil and sweat for gold back in the "fifties." Occasionally you will still find a miner who tells you with the utmost assurance, born of much dreaming, that he has found "the old channel" again, where Dutch Flat Joe, or Kanaka Sam struck it rich in '62 just before the Salmon river excitement that caused the stampede from Beaver.

In this section of the country there are old channels of rich gravel now covered by the mountains to great depths. Where the canyons have been cut deeply through the mountain they have in places laid the old channels bare where they cross them. This tells of other extensive earth movements of great age. Sometimes one will come across an old miner who is rapidly wearing himself out at his work, barely eking out an existence, but who is sure he has found "the old channel" and will tell you how rich it will be. He will regale you for hours, if you seem interested, in giving the history of the camp when "these hills were full of prospectors and miners." It is very interesting sometimes. Again you will find one grown gray, wrinkled and bent with old age and hard usage, who has not always been poor, one who has seen better days, educated, a great reader who always has good books to beguile away the long winter days, when here miles from other human habitation and snowed in he passes his lonely time with no companion but his cat and dog. To see these old men here in such environment and listen to the story which they think about and review too often, one feels that a tragedy is being enacted. Yet such men have grown to love the solitude and the mountains until their features seem to have taken on a likeness of their rugged surroundings.

We must, however, recall ourselves to the summit of Red mountain from which we have made this long degression. Looking now down the long slope we trace the rapid decline to the bottom of the canyon on the north side through which the "Little Applegate" runs, another stream which has been mined from the early days and has been very rich. There are some of the richest placer mines here that are now being operated in Oregon. All that has been said about the delights of an outing on the banks of the Beaver will apply with equal force to the Applegate. From our lookout we can see Rogue River valley and far over the mountains beyond it. Looking again to the south across Beaver canyon, we mark a high mountain about three miles away that extends as a spur southerly toward the Klamath. This is Stirling mountain and contains some

very rich quartz mines. The ledges are pockety and consequently the gold is found in bunches, but some very rich pockets have been found. This mountain seems to have been largely the feeder of the placers of upper Beaver, Deer creek and Bear gulch. Placers have been worked on Stirling mountain within two hundred feet of the top, water being caught from the melting snows and confined in small reservoirs. Of course, the season for such mining is very short, but the ground has been rich enough to justify it and the exepense is light for the sediment in which the gold is found is very thin. The gold thus obtained is but little eroded and is often found with angular bits of quartz clinging to it, not having traveled far enough to free itself from the rock. There are many such places but they are generally high up in the mountains where it is difficult or impossible to get water to work them. Red mountain is cut in all directions with quartz ledges but no mines of consequence have been developed in it. Yet I believe it to be a promising place for future quartz mining, and that sometime good mines will be developed there.

Leaving Red mountain and following the summit trail on to the west for a few miles we come on to the head waters of West Beaver. This is also a mining stream but not to the extent the other is. It is noted chiefly for the "Cinnabar Springs" located on it. These springs constitute one of the natural wonders of the Siskiyous. They have gained a wide, and it seems a just reputation for the great medicinal properties contained, which appear especially efficacious for skin and blood diseases, particularly for syphilis and scorfula. There are many recorded cases that have been cured after the doctors have given the patients over as incurable. Crowds of people flock to them every year. Some take advantage of the limited accommodations furnished by the proprietor and some go prepared to camp. There are a number of springs differing in the properties they contain. Some are said to be poisonous to drink and others are quite palatable. The treatment consists of drinking the water and bathing in the water and mud that is worked up and mixed with it. Some of the springs seem strongly saturated with such properties as are found combined with cinnabar. An extensive deposit of that mineral is found here and at one time a few years ago a company possessed themselves of it and moved in a large lot of machinery preparatory to working and producing quicksilver. For some reason they never perfected their plans and aside from some extensive prospect-

ing and partial development the enterprise has been held in abeyance. That situation prevails to too great an extent in mining matters in southern Oregon and northern California. A promising piece of mining property will be tied up in the hands of speculators and adventurers, on promise to develop it (the owners not being able to do so), and will then be held until all who are not able to stand repeated assessments are frozen out. In the meantime the property lies idle and the whole country is made to suffer. Cinnabar is on the south slope of the mountain. Turning now to the north and looking down the slope to the northwest we have a view of Squaw creek which flows into "Big Applegate." About five miles down the Squaw creek canyon a small valley opens containing some ideal stock ranches. There are two little lakes known as "Squaw" lakes, that in their environment of high heavily timbered mountains and the deep blue of their deep clear waters, remind one of what he has read about some of the romantic lakes of Scotland and Ireland. The lakes and the streams that flow into them are full of trout some of which reach eighteen inches in length. These lakes are very clear and more than a hundred feet deep. The lakes and the lands about them have gone into private ownership and are held at a very high figure. As a mountain home for the stock-raiser the place is almost invaluable, and as a summer home for some man having sufficient money to afford such a luxury it would be great. Almost everything that can be produced in Rogue River valley will grow here. The lower lake appears to have been greatly deepened and enlarged by the sliding of the mountain into the canyon that affords it an outlet. Trees can be seen near the lower end of the lake in a depth of thirty or more feet of water, while the trees still standing on the mountain side near by are all awry as though they had been disturbed in their positions and tipped over. This place is about thirty miles south of Jacksonville.

Still following the summit trail of the Siskiyous after passing opposite the head waters of Squaw creek we come opposite the head waters of Elliott creek. This is another of the beautiful and romantic streams of the region—rich in gold, large in volume, clear and set in a frame-work of forestry decorations that can neither be imitated nor adequately described. The south slope at the north side of its canyon is a continuous natural park of oak, maple, fir, pine and cedar, everywhere carpeted with a luxuriant growth of grass and furnishing pasturage for hundreds of

cattle and horses that are roaming about. Following our summit trail a few miles further we come into the vicinity of the Blue Lead Copper mine. This property was sold by the several small owners that located it, to capitalists from Montana, who paid $150,000 for it after spending perhaps twice that amount in determining whether it was worth it. For the past four years they have worked several hundred men there and since buying it have constructed a fine wagon road to the property which is situated at an altitude of about four thousand feet. A railroad is being projected to it with the prospect that before a great while it will have direct rail communication with Rogue River valley. Moving westerly along the summit of the Siskiyous we come opposite the Big Applegate. As before stated this stream has been the source of a large part of the mineral wealth that has been reaped in south western Oregon.

Chapter X.

A RAMBLE THROUGH AND OVER THE SISKIYOUS.
(Continued.)

"An island full of hills and dells,
All rumpled and uneven
With green recesses, sudden swells,
And odorous valleys driven
So deep and straight, that always there
The wind is cradled in soft air."

If we were to go down into Big Applegate valley and travel to the mouth of that stream we would find its banks dotted with prosperous and happy homes for thirty miles. Sometimes the valley spreads to generous breadth and again narrows to a meager margin. Where tributaries enter it has greater breadth and the industrious farmer, stockman and miner have utilized the fertile bottom lands, the grass covered mountain sides and the gravels on the bars and in the gulches. Remembering that the climate is such as has been ascribed to Rogue River valley, we can easily picture orchards, farms, gardens, fields of alfalfa and grain, pure running water everywhere, all set in frames of lofty picturesque mountains, bordered and decorated with the growths before described. The school house and church appear at convenient intervals and evidence of poverty is reduced to the minimum. Game is plentiful in the mountains and trout in the mountain streams.

Moving a few miles further to the west we reach the summit of Grayback, another of the high points of the Siskiyou mountains. We are here almost on the line dividing California and Oregon, and have thousands of square miles in view. This is a land of magnificent distances, and the shining peaks observed from fifty miles back are seen with equal facility from the top of Grayback. To attempt to describe the general view from each of these high points would simply be a repetition. There is a difference of course, in the nearer details but the general view has much the same appearance and is almost confusing for its magnitude. The snowbanks of Grayback like those of Ashland butte, cling to it in protected spots throughout the summer and send down into the valleys in generous abundance the water so frequently mentioned.

We see the canyons leading way down the rugged sides of this great eminence, dark and somber in the weight of the ever present forest and know that at the bottom of each is singing merrily along, a beautiful stream of that for the lack of which so much of the world's surface is desolate. Crossing now to what is known as "Little Grayback"—itself a greater than mount Washington—we overlook Williams creek in Josephine county, Oregon. This little valley is worthy of special mention. It is twelve or fifteen miles in length and from one to five in breadth. Some of the finest farms to be found in the Siskiyous are in this valley. No country has a greater abundance of water, nor is better supplied with good mountain range. There are large areas of it not yet under cultivation but it contains one of the wealthiest and most progressive communities in the county. Its climate is like that of Rogue River valley and with soil of similar character all it needs to make it a veritable garden spot is railroad communication. Its borders and neighboring gulches produce quantities of gold and the mountains bordering it are supplied with marble of fine quality. In fact from our perch on Grayback we are looking out over broad fields of marble and other limestone to the west, northwest and north, of which mention has heretofore been made. Evidently the time was when these mountains were under the sea and these marble beds were being laid in the water and have since been raised to the surface by the intrusion of extensive granite dykes that make up the mass of the Siskiyous. Doubtless at first this field of limestone, now largely metamorphosed into marble, was practically level and covered hundreds of square miles, or more. The intrusion of the granite and elevation of the mass broke it up and tended to throw it into irregularities. Subsequent erosion has carried away a large part, perhaps the larger part of it leaving the residue on the tops of the higher ridges with deep canyons between. In places where these canyons have been cut to great depths the bedding of the marble may be seen a thousand feet or more above the streams that run at the bottom. This bedding appears to be a bluish slate. Great caverns have been formed in these limestone deposits that have not yet been fully explored, but constitute the greatest natural wonder of the Old Island. A separate chapter will be given to the description of them from a personal exploration by the writer in company with Joaquin Miller, "The Poet of the Sierras" and Senator Jefferson Myer of Portland. Allow me to remark

in passing, that the erosion of these limestone beds has been one of the sources from which these valleys have gained their renowned fertility. The uses of lime as employed in nature make up a very interesting study and inasmuch as the presentation of it will further enlighten the reader on the region under discussion, I will also give that in a subsequent chapter.

We will now continue our visual observation from the mountain top. Remembering that we are still on the summit of Grayback we will direct our attention to some of the canyons trending toward the west and northwest. The principal ones are Deer creek, Sucker creek and Althouse, beginning at the northwest and veering around to the west in the order named. These streams are all tributary to the Illinois river which in turn is a tributary of Rogue river and is a large stream. Each of the streams mentioned, in their lower courses have valleys through which they run, of considerable extent and have the same general characteristics of climate and soil as the others described. In these valleys are large and prosperous settlements, with yet thousands of acres to be reduced to cultivation. From what has been said it will occur to the reader that water for all purposes is plentiful. Sucker creek, Althouse and the Illinois valley are practically one. The upper end of this great area is spread out like a fan, with a reasonably even country lying between the streams, the greater part of which is susceptible of a high state of cultivation. Some of the lands are prairie with considerable areas of oak, maple and scattering pine and fir timber. Much of the oak is of good quality and if the valley had railroad facilities would become a source of important revenue. Kerbyville lies in the valley on the bank of the Illinois river and was for many years the county seat of Josephine county, before the building of the S. P. railroad gave birth to Grants Pass. In the early mining days "Kerby" was one of the chief towns of southern Oregon, which together with Waldo about twelve miles to the southwest, did an important business. During those days all of the southern part of the state obtained its supplies by ocean to Crescent City, thence inland by pack train, later by wagon, and these towns were the chief places of trade along the line to the interior. In those days the neighboring streams were swarming with miners and these towns busy and humming with life and activity peculiar to the western mines. It was placer mining then and these mines were famed as among the richest of all the "upper

country." Since then the placers have been pretty well worked out and freighting is no longer done over the Crescent City road. Farming, dairying and fruit raising have largely supplanted the miner and the freighter and the building of the S. P. railroad has caused the glory to depart from these old towns. Notwithstanding all this, however, quite an extensive trade is maintained for each is surrounded by a growing and thrifty population and mining is still prosecuted to a considerable extent. The farmer, orchardist and stockman finds a market for his produce among the remaining placer miners and the rapidly increasing quartz miners, and the surplus is carted from thirty to fifty miles to Grants Pass. Extensive copper mining interests are being developed near Waldo and a smelter has been in operation for the past three years. These enterprises give employment to many men and the country is being gradually filled and the same appearance of thrift and contentment prevails that characterizes the other valleys mentioned. The mountains surrounding these valleys of Sucker creek, Althouse and Illinois, are wonderfully rich in varied mineral resources, copper, gold, and chrome which carries a goodly per cent of silver and, then, the limestone and marble are not to be forgotten. The magnificent forests that surround these valleys cause covetous eyes to squint and mouths to water. Here we see the first of the white or Port Orford cedar, the most beautiful trees in the world; tall, straight and with foliage as handsome as lace. Here is water power going to waste sufficient to operate the machinery of a kingdom; water enough to reclaim a large desert. Strawberries, peaches and melons that are great bundles of sunshine, sugar and water; marble for the door step of the humblest cottager; apples and pears that would bring the highest price in the markets of the world, all waiting for the bulls and bears and other beasts of the great financial zoo to stop fighting and stealing from one another long enough to build a railroad into this paradise hidden away in the glorious Siskiyou mountains. Looked at from any eminence these valleys make a beautiful picture, green and clad in the finest foliage in the summer and gorgeous in autumn coloring, streams of the purest water everywhere singing lullabys at all seasons. The summer breezes cooled from the mountain tops come laden with odors and incense beyond the power of kings to buy. Yet we read of the sweat shop and the poor consumpted women and children working into the small still hours of the night, by the dim light of kero-

sene lamps, in stuffy dingy rooms in the wealth and smoke cursed cities, strangers to a single breath of God's pure air, working, working, working for the simple possibilities of life and that the rich man may live in splendor. And these same rich taskmasters, what would they do if the opportunity came to them to still further augment their wealth from these vast resources? The answer is easy. They would attack these great forests in their savage greed and make a desert waste of these grand mountains and beautiful valleys, if only they could add to their hoards. The beauty of it as it now is is worth more than the combined wealth of Rockefeller and Morgan, and yet—it could be made more beautiful and helpful to humanity if only a small part of their over-burden were spent here in a proper way. I would not exchange my freedom of enjoyment in the revels I get in the open air in such an environment for all the wealth of either of them, if I had to take with it the terrible disease that almost universally afflicts the confirmed money-getter. The acquired greed for money is one of the worst curses that can afflict any man. Joaquin Miller, speaking of the millionaire in relation to the beauties to be found in such scenes as I have been describing, justly says:

The gold that in the sunlight lies
In bursting heaps at dawn,
The silver spilling from the skies
At night to walk upon,
The diamonds gleaming in the dew
He never saw, he never knew.

Money is necessary in the development of great resources, the development of which is essential for the higher enjoyment and elevation of man. These valleys would support swarms of contented and happy people and give them ample time for the enjoyment of the grand and untamed beauties of the mountains, if only the money-mad were kept away.

I will ask the reader to accompany me down the mountain to Waldo, thence across the mountain by a good wagon road to Crescent City about fifty miles, where we will see the waves of the ocean still washing the shores of the Old Island, for on its western shore it has never been divorced from the briny deep. Wending our way down through the splendid forests, loitering along the streams with hook and line, or camping for a day or two wherever the fancy strikes us, we find an untrammeled satisfaction not to be

found at pleasure resorts, or about great hostelries that lie within the reach of the swarms of the busy and idle of the great cities. Waldo is situated at the extreme southwest corner of Illinois valley where the road to Crescent City starts across the mountains that separate these valleys from the sea. There are but a few houses remaining but their character, size and strength show that they were built for a purpose and under conditions with which they are not now in touch. One is still occupied as a store, another as a warehouse, still another as a saloon, for the miners hereabout think they must have their "booze" and still others shelter the few families remaining. The old hotel shows evidence of its former inportance and still invites the traveler to its homely but wholesome fare. This is also a station on the stage road between Grants Pass and Crescent City, and has its postoffice and school house. About it are some fields and orchards and everywhere in the neighborhood the dumps, ditches and wrecks of old mines are in evidence. Only a few miles away is the copper smelter and lounging about the saloon, store and hotel will be found men who are ready to give information of the last strike and the prospects of great operations in the mines soon. Some of these old miners have been in the vicinity for more than forty years and can tell many interesting stories of their adventures and rich finds. If you were to accompany one of them to his home you would find him housed in a little log cabin far up the gulch, near the banks of a stream. Generally a single room with cooking stove, bed, table, a few shelves to accommodate his dishes, a few home made chairs and benches, while from the rafters and joists would be hanging the rough clothing and accoutrements of the miner and the corners of the room will be littered up with gum boots, gold pans, shovels, etc. One or two rude outbuildings shelter the wood and such other of his heavier possessions for which room could not be found in the cabin. Usually a cat and a dog or two. Always a gun and fishing tackle. Sometimes a little garden patch and perhaps a few fruit trees. Here he has lived year in and year out, growing old and every day taking on more and more of a resemblance to his rugged surroundings. His cabin is always open to the belated or fatigued wanderer. He will share his bed and frugal fare with a generosity and hospitality scarcely found anywhere else, though he may have carried it in here on his back for many a weary mile over the rough mountain trail. No experience is more interesting than unexpectedly to come

upon such a habitation just as the shades of the evening are coming on, and the night noises of these great forests are beginning to be heard and felt, perhaps just as you are thinking of passing a lonely night with your back to a log and only the trees and sky above, tired and hungry. The smoke from his little clearing attracts you and a moment later you are welcomed inside his humble home. Many questions are asked, the stove is lighted up and soon you are invited to sit up, as ravenous as a bear, and enjoy his home-made bread, fried bacon, black coffee and potatoes. I have had such experiences and never did spread at the most high toned resort give such satisfaction. The meal done, pipe and tobacco are produced and seated by the blazing fire an interchange of conversation follows long to be remembered. Morning comes, breakfast over and you go out into the crisp sweet air of the mountains, laden as it always is with an aroma wild and delicious and you feel that you too, could spend the remainder of your days in such an environment. The old miner follows you to the gate, begging that if you ever come that way again to be sure and stop with him. As you say your heartfelt good bye he asks you to give a little message for him down at the store as you pass by and you are out on the trail in the full enjoyment of the morning walk after the cheer of such a night. Sometime, sooner or later, the old miner will be missed longer than usual from the store and some one goes to see about it. It is the old story. The rocker is idle by the stream, the frightened cat scurries for a hiding place. There is no response to the anxious knock, The latch is raised, the door swings opn to the push, the room is dark and cold but otherwise as you have seen it before except-that cold, stiff form on the bed in the corner. He died as he lived, alone. Miners are notified, a grave is dug in his own little clearing and he is laid to rest in the spot he so long called his home.

Chapter XI.

FROM WALDO TO CRESCENT CITY AND UP THE COAST TO COQUILLE RIVER.

"Roll on, thou dark and deep blue ocean—roll!"

From Waldo across the mountains to Crescent City is about fifty miles, and the direction is west by a quarter south. The mountains are very rugged and belong to the Old Island formation. They are generally classed as the Coast range, but this is a mistake, as the Coast range abuts upon the Old Island north of Coos bay. The junction has not been scientifically ascertained as yet, though Prof. J. S Diller of the geological department having charge of field work has been making the survey northwest of Grants Pass the past season, and as the work progresses northerly the point will be determined. In fact the Old Island has as yet received only casual attention from the department of geology but in the future will furnish most interesting data among the geological records. I have said that the main mass of the Siskiyou mountains is composed of granite, but it must not be inferred that there are not large areas that now show aggregations of other formation. In places the intrusive granite has not reached the surface either in its upward movement nor by erosion of the sedimentary formations that covered it. In many places the erosion has been complete, in others it has not progressed to that stage.

There is a good wagon road for so rough a country, between Waldo and Crescent City and a daily stage line passes over it. The first nine or ten miles out from Waldo is a heavy mountain climb, continually upward. Here we reach the summit of the first and highest ridge and from the top will indulge in the view as it presents itself. To the east, northeast and southeast the view is an inspiring one. The Illinois, Sucker creek and Althouse country lies spread out below us with perfect distinctness and presents as fine a picture as any of the many heretofore described. Grayback and the other high points of the Siskiyous rise grandly east of us showing their great areas of forest with here and there patches of snow above the timberline. With a glass farms and orchards can be seen in the valleys and beyond them far to the northeast can be seen the high eminences of the Cascade mountains. The lower moun-

tains lying between us and Rogue River valley emphasize the perspective and enable us to determine the borders of that valley where the Cascade mountains impinge upon it. To the south and southwest all is mountain billow cut with canyons and clad in forest. Turning now we pursue our journey to the west and at once commence a descent by a reasonably regular grade but by a very sinuous course. So steep is the mountain that in places several tracks seem to be lying along the mountain side below us. We discover that it is only our own road which seems to double and bend upon itself. The mountain slope down which the road runs has been burned over and there is little but burned stumps, brush and rocks covering large areas, as sad a sight as the ruins of San Francisco were. The timber has started again and in spots has made considerable progress, but upon the whole the mountain is practically a barren waste for many a weary mile. The grade by erraitc courses drop us rapidly down. Occasionally we cross a ravine with water. At Shelly creek we notice sand stone About fifteen or twenty miles out from Crescent City we come into the redwoods. Here the country is practically level. The dense growth of redwood timber stands so tall and thick that the sun seldom penetrates enough to be felt. The undergrowth is a perfect jungle of brush and ferns, the latter reaching eight or ten feet in height. Fogs almost constantly hang over the forest, so dense and low that the tops of the trees are sometimes obscured. We are down almost to the sea and the ground being practically level and always shaded never dries out. The roads are covered with holes and split redwoods—corduroy it is called—to make them passable. The jungle is matted with vine maple, hazel and other growths so dense that it is almost impossible to get through it and being always wet and often boggy would soon become impassable in the roads but for the corduroying. We notice a decided difference in the atmosphere. In fact as soon as we started down the mountain we sniffed the salt sea breeze with a relish. I shall not stop to describe the redwood, it has been done so often that the reader is doubtless familiar with it. Here is an almost virgin forest as yet little disturbed. At Smith river a few miles out is quite a settlement chiefly engaged in dairying. Where the timber has been cleared away the growth is rank and rapid. Clover seems to be indigenous and grows to perfection as does the redtop and timothy. Occasionally there are spots of prairie, or lands only covered with brush, where the difficulty in mak-

ing farms is comparatively light. The greatest trial of the farmer is to keep down the fern, the humidity makes it almost impossible to kill it out. Clearing up the timber lands along the coast is a very arduous and laborious task, and the making of a farm is the work of a lifetime. Whereever the logs, trees and brush are cleared away the redtop, timothy and clover is grown in rank abundance without difficulty. This greatly enhances the value of these lands for dairying, particularly as the only facility for shipping is by sea from an open roadstead, where for long periods at a time vessels cannot safely lie at anchor. Loading and unloading is done by lighter which is impossible in a rough sea. Notwithstanding all of these difficulties, including bad roads and high mountains, the early day settlers and miners in all of Southern Oregon had to depend on Crescent City as a receiving and distributing port. Lumbering is carried on to a considerable extent and with a good harbor this would soon become a famous lumbering point. Crescent City is the county seat of Del Norte county, California; the extreme northwest county of that state. There are roads running southerly along the coast to Humboldt bay and northerly to Coos bay. The town is a place of considerable importance and many of its people have grown wealthy in the various avocations that have been pursued here. Though the S. P. railroad is practically hundred miles away the building of it took from Crescent City a great part of its resource. No longer do ships unload here for the interior nor packtrains or freight wagons take cargo.

In many respects Crescent City is a picturesque place with the broad Pacific and its ceaseless surf directly in front and the redwood forests and high mountains behind it. Many people from the interior come here during the summer for an outing and to enjoy the surf and sea breezes for a season. At Smith river the fishing is good and clams are obtained in abundance when the tide is out. Hunting for agates and rare shells on the seashore is a pleasant and sometimes an exciting pastime. A great reef extends out for miles where seals and sea lions abound and around which cod and halibut fishing is fine in good weather.

With saddle horses and good weather a trip up the coast a hundred miles or more to Coos bay is an enjoyable diversion and thither we proceed in our present inspection of the shoreline of the Old Island. Leaving Crescent City we proceed sometimes directly along the seashore and sometimes are driven inland by a mountain spur

that forms a headland extending out so as to prevent the forming of a beach around its foot. We cross Smith river near its mouth where it has the appearance of a stream of magnitude. The tide runs up quite a distance and were it not for the drifting sands at its mouth it might be used as a harbor for small craft. A few Indians may still be seen living in small huts and substisting on fish and game and by selling trinkets of their manufacture to summer visitors. Some of them work for the whites when work is to be had. Further up the coast we cross Chetko and Pistol river, each of which discharges large volumes of pellucid water directly into the ocean. Occasionally we find a settler and sometimes a small settlement. The land is always good where there is a level margin sufficient to justify location. Everywhere is cedar, spruce and fir as fine as can be found anywhere in the world, but inaccessible for commercial purposes as yet, and likely to remain so for many years to come for want of an outlet and facilities for transportation. Every now and then we hear rumors of a projected railroad up the coast, but one who travels along it cannot avoid the conclusion that several generations are likely to come and go before such an event will come to pass. The mountains run down steeply to the shore at many points and are cut by deep canyons with high steep ridges between. It would be a very difficult and expensive undertaking to say the least. It is true that the mountains are full of valuable mineral and covered with vast and valuable forests, and also true that there are many small valleys of valuable agricultural land, but whether the roads will come from the main line inland, or some other method will be employed is yet problematical.

We cross the line into Oregon and come to Gold Beach at the mouth of Rogue River. Here we find our stream a mile wide and capable in good weather of admitting vessels of a moderate size. Gold Beach is the county seat of Curry county and is supported chiefly by the beach mines and by fishing. The fishing industry was developed here by R. D. Hume who grew very wealthy and acquired the title of the "Salmon King" of southern Oregon. Mr. Hume died a few months ago leaving a very large estate in Oregon and California. He was a very astute business man, persistent and aggressive and practically acquired a monopoly of all business at Gold Beach. He owned stores, saw mills, and his own vessels by which he carried his products to San Francisco and other markets. His vessels were of necessity limited to suit the character of the bar at the

mouth of the river. He will doubtless be missed and it is hardly likely that another will soon be found to take his place. There will be a better chance, however, for men with less capital who would have built modestly but could not compete with the "Salmon King."

The black sands were early discovered to be very rich but being magnetic it has been a difficult matter to save the gold. Besides this the mining being in the sands on the beach, permanent works could not be established because of the tides and the heavy surfs. Various devices have been resorted to to extract the gold from the magnetic sand and while much money has been made from these beach mines, there have been few who have realized the hope of the miner. There is gold enough to justify men of wealth to take hold of it if the proper method of working the sands could be devised. It appears that much of the gold that is found on the beach has come down Rogue river, which in the ruggedness of its lower course is a genuine rock crusher. As has been said the mines along Rogue river are and have been very rich. Its bars like those of the Klamath river, have been worked wherever they could be reached. From the upper Rogue river down all of its tributaries have yielded gold and many of them, much of it. Hence it is not strange that quantities have eluded the bars and the miners up the river, and being ground finer and finer as it proceeded down stream has, when it has reached the ocean, been thrown upon the beach. Recurring again to what was said several chapters back in speaking of the Klamath river, that it has no gold above where it enters the Old Island, so it is with Rogue river, it has produced no placer gold until it receives the tributaries from the Siskiyou mountains, or has reached the point where it crosses the shoreline of the Old Island. Rogue river here at its mouth has its history of romance and tragedy. The crew and passengers of a wrecked vessel in the early days made shore here and had to fight the Indians and sustain life by hunting and fishing until assistance arrived. But I am not writing that kind of history and must not be led into it. If this little book should be received with a sufficient degree of favor I might attempt to write the scraps of history that have been made in this region and are as yet unwritten. In 1883 while I was Collector of Customs for the district of southern Oregon, stationed at Coos bay, my jurisdiction extended down to the California line. Gold Beach was, therefore within my bailiwick and I had occasion to come here on official duty.

At that time there was only a small trail, no wagon road, between here and Port Orford, thirty miles up to the coast. While at Gold Beach (it was Ellensburg then), a traveling salesman came in from Crescent City and as the ride to Port Orford was a lonely one without company, we arranged to travel together and fixed the date of our starting. Having secured horses on the north side of the river we hired a man to put us over in a skiff. It was a bright windy morning and for the first ten miles or more, our trail was over rolling grass covered hills in sight of the ocean and a part of the time on the beach. The timbered mountains stand well back and this beautiful wild pasture being covered with cattle, horses and sheep, presented a fine pastoral scene. Our horses were fresh and in good condition and we cantered along with much enjoyment. Some miles along a high headland runs down to the sea and we had to pass over this, reaching an elevation of almost a thousand feet. As we started up the steep trail, with the land breaking away sharply to the sea, the wind rose to a gale and the surf beat upon the shore at a fearful rate. The higher we rose the more steeply did the hill seem to break down to the water. Mr. Parson (my companion, was behind and I ahead. Bye and bye I thought I heard him call and looking back saw him on the ground leading his horse and making frantic motions toward me. I stopped until he came up and observed that he seemed greatly excited. When he came near so that I could distinguish his words above the din of the surf and the rush of the wind I found that he was characterizing me in language that missionaries are not supposed to teach, as a ——— fool, and loudly demanding that I should get off of my horse or I'd be blown into the sea. In fact my friend was suffering from the most painful fright I ever saw a man in. He thought our position a most dangerous one with the mountain breaking down at a dangerous angle into that violent surf. I think he would have been thrown into hysterics if I had not done as he wished. When in the course of a half mile we had reached the top and even he could see that we were not in any danger, he was so overcome that I had to wait for him to steady his nerves before proceeding. After passing over this we came down onto the beach where we had fine going until we reached Eucher creek.

Eucher creek is a delightful little stream discharging directly into the ocean. We had been told to follow the stream a short way and we would find a farm house.

It was about noon and we were ready for dinner after our romantic ride over the hills and along the beach. The bed of the canyon was not more than a hundred yards wide and we were surprised to find that only a few hundred yards in it opened up into a beautiful little valley about two miles long and perhaps three quarters of a mile in its greatest width. I have read in novels of such a cove, but never before saw one that was so complete. The stream wound along through it so clear that all the colors of the pebbles on its bed were distinctly shown. The hills arose on either hand rather steeply and were covered with timber and brush in autumn dress. Little groves of maple, oak, alder and ash stood here and there and fronting the stream and only a few rods away was a neatly constructed cottage, framed, covered with rustic and painted white. The yard was enclosed with a picket fence; barns and other out-houses were ranged about, the fields just beyond and a separately enclosed garden near by. Ducks and geese were swimming in the stream or waddling along the bank, while turkeys and chickens were engaged in the usual occupation of such poultry. Hogs were rooting about or sleeping under the trees. In the door yard were an abundance and variety of flowers and on the porch and in the windows were pots containing flowering plants. Everything was as neat as a pin, while the sound of the surf just outside the gateway came clearly to the ear. The spot was the most romantic I ever saw and everything boded contentment, love, civilized intelligence and that oft sung vision of a "cottage by the sea." We found the proprietor, made our wants known and were invited inside the house to await dinner. What we saw inside was no less attractive and we were curious to know something of the how and why. The man and his wife were very intelligent people and from them we learned that they had lived there several years. The man had once been a police officer in San Francisco and his wife had been raised in the city. While up north on some official business he had accidentally dropped in here and was at once so enamored of the place that he began negotiations for it. A conditional purchase was agreed upon and he returned to the city for his wife. They visited the place together and were of the same mind in regard to it. They bought it and at considerable expense made the improvements I have described and declared that they had never regretted the change.

After dinner and a ramble about the valley for half an hour we again took up our journey. Soon after leaving

this little valley of enchantment we climbed inland over another headland which barred our way on the beach. Reaching the top about a mile or more inland we struck the head of a stream which we followed down its whole course of several miles and came out on the beach again about four miles below Port Orford, which place we reached about five o'clock in the evening, having run a gauntlet of fire for a couple of miles where the stream passed through some heavy timber. Here Mr. Parsons came near having another attack of hysteria. To get mixed up with a forest fire in the mountains is not a pleasant experience at best and this did look dangerous, for we could not get away from the stream and the fire was on both sides of it.

It was our purpose to take the stage at Port Orford for Bandon at the mouth of the Coquille river, thirty miles north. The stage made the trip down one day and back the next and had that morning left for the north, so that we had to stay over one day and two nights. This was satisfactory for the headlands, beach, lagoons, and country about were very interesting. The weather was fine and after supper we climbed the promontory just west of the town and watched the sun sink into the blue Pacific. The place is one of the most picturesque to be found on the coast. It is only a few miles below Cape Blanco, the most westerly point in the United States and the village stands on high land overlooking a beautiful fine weather harbor. A great curve is here made in the shore line forming a crescent open to the south with the western horn projecting in a sandstone headland southerly, almost one hundred feet high, forming in the bight a good shelter for ships in a northwesterly storm. Here I watched the thundering surf beating against the foot of this headland and noted the manner of work it was performing. The evidence of sea action which I have described among the sandstone cliffs along the sides of Grizzly mountain and in the vicinity of Ashland, I find verified here and in present operation. As these mountain billows come rolling in they break with great force against the cliffs, throwing the spray fifty feet high. Where there are seams and fissures in the cliffs the force of the blows keep cutting deeper and deeper until arches and caverns of large extent are formed. Occasionally the power of the water has forced immense slabs, weighing hundreds of tons, from the wall and as they topple over are gradually ground to sand by the weight and force of the waves. All of the headlands and cliffs that we have passed from Crescent City on our way up the coast,

bear the same evidence of this action and in every instance are easily identified as the objects of attack by the same elements that have cut and carved the sandstone cliffs of Grizzly mountain. To the northwest of this headland is Agate beach, where quantities of fine agates are found and around the sides of Grizzly and along the foot of the Cascades we find the material from which they are worn smooth and beautiful by the sea. Between the town and the beach to the northwest is a lagoon of considerable extent and depth and literally alive with trout. The lagoon is separated from the surf by a ridge of sand dunes nearly a hundred feet high and absolutely barren of all vegetation. Captain Tichenor located here about sixty years ago in the belief that at some time it would become a port of importance and the government has at times investigated it as a possible site for a harbor of refuge. The expense, however, would run into the millions and as yet it has not been undertaken. With enough outlay it would doubtless become a boon to the coasting trade and other vessels sailing these waters in bad weather. There are very few harbors on the Pacific coast that vessels can safely enter in heavy and continued gales. The settlement here has not been particularly remunerative to those who cast their lot in it on account of its isolation. Coasting vessels frequently run in when the weather is good or for shelter from northwesters, but regular packets seldom stop. Having spent an interesting day fishing in the lagoon, gathering agates and shells on the beach and studying wave action on the rocks we climbed into the stage on the second morning after our arrival and just as the early sun began to light up the crests of the combers we plunged into the forest, bound for Bandon. The road was good and fairly level. A few ranches were passed and a few miles out we crossed the Sixes which is a stream of considerable importance, clear and cold and running with a strong current. A few miles up this river there is gold mining of considerable extent, but that which strikes one most is the timber, Port Orford, or white cedar, yellow fir, spruce and along the streams myrtle, maple and ash. We are entering the forests that have made Coos bay, Coquille and Port Orford famous. Along the Sixes are occasional farms that have been made in the vine maple and myrtle flats where the heavier fir, spruce and cedar were not in the way. The soil is excellent and for miles and miles we travel over an almost level country that sometime in the future, when the timber shall have been cut away and the ground cleared

for cultivation, will become a wonderfully rich agricultural region. We come to Flora's creek and find quite a settlement, the people generally engaged in dairying. In this vicinity are lakes and marshes that furnish fine pasturage and meadow lands and are also great places for ducks and geese. This is a sportsman's paradise. After passing Flora's creek a few miles we come to the beach again having left Cape Blanco behind, and for eight miles enjoy the ride on the surf beaten sand at low tide and watch the breakers rolling in. Often they come so far up on the beach that the water almost reaches the wagon box. A short way out we can watch the sea lions swimming high on the rollers and watching us with apparent curiosity. On the beach we pass New river, so called because now and then the drifting sands cause it to change its course and sometimes they dam it up entirely, forming a lake back of the sand dunes; another great duck shooting field. A few miles further on we leave the beach and drive a couple of miles across the sand hills to Bandon on the south bank of the Coquille river. Our trip has been a delightful one, thanks to the weather, but we are tired and the salt air has contributed to give us a ravenous appetite. Here we find good accommodations and will remain over night and take a steam boat up the river in the morning.

Chapter XII.

BANDON, THE COQUILLE RIVER AND COOS BAY.

"I have heard the call of the wind-swept pine
And there bides no rest for me;
My soul is drenched with clear star-shine
And drunk with the wine of the sea."

Bandon is situated on the south shore at the mouth of the Coquille river, about twenty miles below Cape Arago, which is just off the entrance to Coos Bay. At this writing the town is grown to considerable importance. It has a remarkably picturesque situation, fine beach and rocks just off shore where thousands of seals and sea lions congregate during the season when they seek the company of each other. No place on the coast furnishes a better opportunity for studying these interesting animals. I have seen thousands of them on and about these rocks at a time. The seal rock at San Francisco do not compare with these in the numbers of sea lions that frequent them. This is coming to be a place of summer resort for frequenters of the sea side, and when railroad communication shall have been completed with the interior it will doubtless become one of the most popular resorts on the coast of Oregon. The high headland affords a fine outlook seaward, the broad river mouth which constitutes the harbor extends miles inland, the bar is directly in front and the rolling Pacific in its boundless energy dashes upon the rocks and lashes the beach with a never ending roar. The town-site is an undulating table-land about one hundred feet above the tide and extends inland as such for several miles, gradually ascending to the foot of the mountains. The soil is sandy and has been built by the action of the surf and wind. This tableland is covered with a stunted growth of spruce and cedar which is very ornamental but of little use except for firewood and fencing materials. A mile or two inland are evidences that the continent is expanding here, as elsewhere along the shore of the Pacific. These evidences consist of great depths of beach sand and shells with drift wood such as we now see gathering along the beach. The country lying between the Coquille and Coos Bay is a peninsula extending inland for several miles and consisting of marine drift. One studying it closely would

come to the conclusion that the time was when all of this peninsula was a bay and has been filled with the wash and drift from the ocean and the Old Island, aided by the upward movement of the coast line and the drifting sands that are constantly moving along the shore. Miles back in this peninsula beach drift shows plentifully where erosion has cut deep channels through it, or where, in digging wells, or mining for coal the drifts are uncovered. The peninsula is practically level, at least the hills are not high enough to be dignified by the term mountains, and much of it is level. The inequalities are not greatly different in contour or proportions from the moving sand dunes that are being constantly built up and torn down along the ocean shore by the action of the winds. All of this peninsula is covered with a wondrous growth of yellow fir (called Oregon pine), spruce and gigantic Port Orford cedar. I measured one cedar tree that had been blown down, which measured sixteen feet in diameter twenty feet from the ground, was nearly two hundred and fifty feet high and almost two hundred feet without a knot or a limb. This was, of course, an unusually large one. There are many arms and indentations reaching into the peninsula from the bay that afford good facilities for logging. Around the edges of these indentations and along the numerous streams that run through the forest are dense growths of myrtle, maple, vine-maple, hazel and ash. Sometimes areas of many acres are covered with rhododendron with its ever green leaves and remarkable red and purple bloom, large as large roses and as beautiful, a more cheery sight can not well be imagined. The ever present fern also grows in rank profusion. The dense undergrowth is tied and matted together with wild blackberry vines that produce quantities of luscious fruit where the sun has a chance to sweeten it. Salal and salmon berries also grow in great quantities.

Having taken a casual glance at the country lying within the peninsula, we will leave it for a time and recur to it again, giving now brief observation to the beautiful river and the country lying along it. First, however, I wish to pay a tribute to the excellent hotel accommodations to be had at Bandon, which has for several years been fostering the growth of her summer resort business. In its improvement it has its newspaper, excellent schools, several hotels, some manufacturing and, lying as it does at the mouth of a harbor second only to Coos Bay, with a navigable river upon which boats ascend to Myrtle Point, forty

miles inland by the course of the stream, navigable also for coasting schooners of fair size to Coquille City twenty miles up stream, all of which tend to give assurance of future importance. The government has for many years been quite generous in its appropriations for the Coquille and the bar has been greatly improved. Tugs are kept here to accommodate the vessels that frequent the port and it is not unusual to see several ocean craft lying at anchor in the harbor at one time.

For several miles the river varies from one to two miles in width and salmon canneries and saw mills are seen at frequent intervals along its shores. Ship yards where vessels are built also occur and no country in the world affords finer timber for the construction of water craft. It constitutes one of the great businesses of both Coquille and Coos Bay. Ships that were built at Coos Bay are now navigating the waters of all parts of the world. Spars and ships knees, planking and finishing lumber for ship-building are shipped hence to the Atlantic shores and to foreign countries. Moving on up the Coquille the most phlegmatic will be struck with the beauty of the stream. After the lower expansion it drops to a width varying from a few hundred feet to half a mile, its shores everywhere bordered with myrtle timber, among the most beautiful and decorative trees that grow. These trees have bodies that sometimes measure four or five feet in diameter. As a rule they branch out rather low and their great spreading tops and ever-green leaves overhang the pellucid stream as if admiring a reflection of their own beauty. I have never steamed along between those splendily shaded banks that I have not caught myself humming "The Blue Juanita." Nothing is more soothingly pleasant to me than a ride, in good weather, on the deep, quiet waters of the Coquille, this water boulevard, bordered with these beautiful, aromatic trees that seem to reach out their branches as if to extend their protecting shade across its whole surface. Every now and then our little steamer sounds its whistle and rounds into a landing fixed under the shade of a great tree. Men, women and children flock to the landing, mail is discharged, perhaps some freight put off or taken on, a few words exchanged, we cast off and are soon moving on watching the trees and noticing the salmon that are jumping here and there making great circles of ripples on the water. There is a margin of greater or less extent of the finest agricultural land along both shores clear up to Myrtle Point and many fine farms have been made. The

bottom lands along the river, in fact along all the streams in this section of the country, are very rich and will produce everything that is suited to the climate—fruit, vegetables and all kinds of hay. Grain does not do so well on account of the prevailing moisture which causes rust and prevents the grain from maturing. Much of these bottom lands have been cleared of the myrtle, maple and ash and the other growths that have been described. The denseness of these growths makes the clearing of a farm a long and laborious task but when completed the happy owner has a little kingdom all of his own.

For furniture and fine finishing work there is no timber that will excel the myrtle, birds-eye maple, ash and white cedar burl, all of which are produced here in great abundance. It is sad, however to see the waste of these splendid materials. In clearing up a farm these trees are cut, rolled into heaps and burned to get them out of the way. Some of us remember this same kind of wastefulness that years ago prevailed in parts of the Mississippi valley with reference to the walnut, maple and wild cherry that were treated in the same way. Now half a dozen of these great logs of walnut that were thus destroyed would bring enough money to buy a modest farm. The value of this timber was not appreciated until it was gone. Even the few remaining stumps are being dug up and sold at big prices to be worked into veneering. Nothing makes a finer veneer than the myrtle. It is so limited, however, that within a few years the timber that is being destroyed, if saved, would bring more than the land upon which it grew. I have seen some of the finest furniture and inside finishings in ships' cabins made from the myrtle. The finest exhibit at the Lewis and Clark Exposition at Portland came from Coos and consisted of these woods. They may still be seen at the forestry building at the exhibition grounds. I have seen a schooner load of Port Orford cedar consisting of five hundred thousand feet, loaded at Coquille, no board of which was less than two inches thick, two feet wide and twenty feet long and not a knot in the whole cargo. Such lumber at that time (1883), brought, in the rough at San Francisco, sixty dollars a thousand. Thousands of cords of this cedar was cut and sold at fifteen to twenty dollars a cord at the wharf, to be used in the manufacture of matches.

Twenty-five miles from Bandon we reach Coquille City, the county seat of Coos county. This town is well situated having an excellent country surrounding it and is the

head of navigation of ocean going vessels on the Coquille river. Here freight is taken for the coasting trade and for the Sandwich islands. Many of these schooners voyage hence to the coast of South America. The hills about Coquille city are not high, but as a rule are, or have been heavily timbered. The soil is a rich clay and when the timber is taken off and the stumps burned out will produce great crops. These old logged off areas are generally allowed to grow up with the ordinary dense growths that I have described, which are sometimes kept down by pasturing with sheep, goats and cattle, and when so pastured they become excellent grazing lands, for clover and a kind of blue grass spring up spontaneously and grow luxuriantly. There are many clearings and farms where the forests once stood, and the area so reduced is growing rapidly from year to year. From Coquille City it is about a dozen miles to the northwest to Marshfield and the two are connected by rail. Marshfield has for many years been the principal city of the Coos country. Its claim to that distinction is now being strongly contested by North Bend, which is situated three or four miles further down the bay to the north. If we were to return down the river four or five miles from Coquille City, we would notice prairie to the north from which a stream flows into the river. That is Beaver slough and consists of five or six thousand acres that some years ago came under the designation of swamp and overflowed land. As such it went to the state and was disposed of at one dollar per acre, twenty cents per acre to be paid down and the other eighty cents to be paid on proof of reclamation by drainage, at which time a deed would be made by the state. Land grabbing under this land law furnishes one of the rankest chapters of grafting in the history of Oregon. This Beaver slough tract is one of the finest bodies of land to be found anywhere, and so far as I know it has never been reclaimed. A dyke along the river and a tide gate at the mouth of the slough, a little ditching, tiling, and clearing of brush and this tract would be worth a quarter of a million dollars. It extends back from the river four or five miles and the tide which runs up the river enters it and runs almost to the head of the slough. There are a great many smaller bodies of such land along the many sloughs that run back into the country from Coos bay and Coquille river, that will sometime become the most valuable lands in the country. These sloughs have the advantage of gathering in the depressions where they lie, the very cream of the higher sur-

rounding country, which in time becomes very deep. Such tracts are world beaters for clover, red top, timothy and other grasses; the most alluring spots for dairymen. They will also produce anything that can be raised in that climate, which means a great deal.

From the head of Beaver slough to the head of Coos bay, is about five miles and is designated as "The Isthmus." The country between is somewhat elevated and covered with timber and at the head of the bay is an old coal mining town called Utter City to which steam boats on the bay run daily. From this point the course of the bay is almost north for about twelve miles to North Bend where it turns abruptly to the southwest for about eight miles and enters the ocean. The town of North Bend is on the south and west shore of the bay and opposite to North slough which comes in from the north and covers another area of so-called swamp and overflowed land. This area abounds in little lakes and channels that afford the finest fishing and duck shooting, and around it is good land and some good timber. Four miles back, up the bay from North Bend and on the same shore is Marshfield. Two miles south from Marshfield and near the head of coal mine slough, is New Port, where are located the coal mines of Coos county. Ocean vessels load coal at the wharfs at New Port and its shipment has been one of the chief industries of the Coos country for the past fifty years. These are practically the only coal mines being operated in the state. The coal, while not an anthracite, is excellent for all uses required. The coal field is extensive and thousands of acres of coal lands have been gobbled up under the guise of homesteads and pre-emptions, another field in which the United States has been defrauded of large tracts of land. It is probable that the statutes of limitation have run against these frauds. Four miles below North Bend and on the same shore of the bay, is Empire City, for many years the county seat and principal town. The Custom House is here, and back in the '80s an extensive lumbering establishment was laid out at Empire and a magnificent mill erected. It did indifferent work, however, and in a few years was dismantled, and the old town presents a very dilapidated appearance. It is the port of entry, occupies a beautiful and romantic site, overlooking the lower bay and having a view of the surf for ten miles up the coast. I remember with keen pleasure the almost four years I spent at Empire and feel sad at the decay of the old town. North Bend, Marshfield and Coquille City are forging ahead and the first two are sites of

great lumbering operations and shipbuilding. About half way between North Bend and Marshfield and on the opposite side of the bay Coos river enters. This stream is navigable for twelve or fifteen miles and is bordered with fine farms and a thrifty population. Other hamlets dot the shores of the bay and other settlements have appropriated eligible sites further inland and in the mountains. This little bay affords an interesting and lively appearance. Its people are largely from Maine, Massachusetts and other northeastern states. Many of them have been reared to a seafaring life and many more come from the Maine woods. The manners are essentially of the New England type and the people are noted for their generosity and hospitality so characteristic of the country from whence they hail. Many are from Boston and never allow you to depart without impressing that fact on you. But they are good people and no more enjoyable time could be had than at a New England clam-bake and celebration at Coos bay.

Among the sources of sport and recreation nothing could be more enjoyable than a trip of a week's camping up Coos river angling for the speckled beauties in which its waters abound; or a day at Cape Arago lighhouse on the island; or a saunter on the beach in good weather; or fishing for tom-cod from a small boat with a dozen hooks on your line and sometimes getting a fish on every hook at a single throw; or spearing flounders at night from a boat by the light of pitch-wood torches, or even lounging around the jetty, catching rock cod with a long line and heavy weight, or lying under the shade of a spruce tree on the headland looking off at the gently rolling billows, gathering clams at low tide, or catching crabs with a garden rake. All these are sources of pleasure such as having once been enjoyed will never be forgotten. Then again, when storms are on and friends are out on the water; when the surf rises as it scarcely does anywhere else in the world, until its pounding on the beach shakes the ground where you stand and rattles your windows in the dead of night. When Old Boreas is on the rampage many weird sounds are heard and many creepy apprehensions aroused. One having grown familiar with such things would not guess long at the peculiar craving of the sandstone cliffs along the sides of Grizzly mountain. Here, then, and at the mouth of the Coquille and at Port Orford, we have harbors, perhaps the only ones of the Old Island where the sea is operating much in the same way it did when the beach lines we traced on the sides of Grizzly were being buffeted by the billows of

this same ocean. Here we have found and entered deeply into the coal mines, now on a level of the sea, that in their forming belonged to the same date with the dposits we find near Siskiyou station four thousand feet above the sea and more than two hundred miles away. We would not expect to find fossils belonging to the creatceous era along this beach where the ocean has been continuously in action during all that period of time described in the earlier chapters of this little volume, and we do not find them.

Cape Arago extends for some miles out to sea from the south side of the entrance to Coos bay, and terminates in an island on which the Government lighthouse and life saving station are established. The mainland at this point is a promontory from which a splendid view is obtained to the limit of vision up and down the coast. The island is from half to three quarters of a mile in length and at its widest part is only a few hundred feet across Near its middle it is almost cut in two by the action of the sea and a hole has been cut through it almost large enough to sail a good-sized schooner through. This opening is arched over affording a natural bridge over which the light-keeper passes from his residence to the lighthouse. At this point the island is so narrow that before a walk and railing were put over it the keeper had to crawl on his hands and knees on stormy nights in fear of being blown off the island. This island is fifty or sixty feet high and the sides are vertical to the surf and are solid sandstone cut and carved as is usual in such places. The lighthouse stands at the outer extremity of the island and is about eighty feet high. Notwithstanding the elevation the lenses are often incrusted with salt from the spray that is dashed against them during hard storms. Still beyond the island a reef extends and at its outer point is a whistling buoy whose hoarse bellowing can be heard miles inland when the wind is favorable. Still beyond the buoy the reef extends covered by several fathoms of water where cod and halibut fishing furnish recreation and profit when the sea is sufficiently smooth to permit it. The island is connected with the mainland by a suspension bridge two or three hundred feet long. At low tide there is not much water in the channel but when the tide is full and a southwest gale is blowing, the sea rushes through it with fearful volume and force. The life-saving station is located on the island also and on the shore of this channel the life-boat must be launched, a wild operation in a rough

sea. The writer had an experience here in 1883 which will be remembered as the adventures of a lifetime. As it will, in my judgment aid us in the nature study we have been pursuing I will give it.

The occasion was the wreck of the new steel steamer Tacoma bound south from Puget Sound with her first cargo of coal, carrying 5000 tons and trying to make a record trip. I was collector of customs at the port and ex-officio had some duties in regard to the life-saving service, which at that time only maintained a keeper but no crew, a volunteer crew being depended on in case of an emergency. Late one evening a man in oil skins and sou-wester appeared at the office and excitedly announced that the steam ship Tacoma had gone ashore above the mouth of the Umpqua, twenty miles to the north and was being hammered to pieces on the sands. She had a crew of fifty men and a few passengers and no means of getting ashore except by making rafts of deck wreckage, the boats having been stoven and broken. There was a fearful storm raging and the messenger had been sent down the beach to get the Cape Arago life-boat. I at once set about to gather a volunteer crew. Several vessels lay in the harbor but the sailors were loth to leave their snug berths for so strenuous a service. I succeeded in getting enough to promise to man the boat, but inasmuch as a tug would have to accompany it to the scene of the wreck, and neither the life-boat nor tug could be taken out until high tide, which would not occur until about four o'clock in the morning, it was proposed that I should take another crew to launch the life-boat and meet the tug off the bar at that hour and the volunteer crew would come out with the tug and take charge. I gathered up eight men, most of whom were safe men for such an enterprise, and at dusk we set out on foot for the station eight miles away. It was a stormy blustery night and we had to cross south slough (almost a mile wide) in a rickety small boat, which we accomplished without accident. Pitchy darkness had now set in and when we reached the station the waves were beating upon the island with such force that it shook and quivered as if in danger of being washed away. We could do nothing until the tide was well in, hence employed ourselves with loosening the hatches of the boat house, which was built in a bight of the channel shore and stood on piling above the narrow beach from which we had to lower the boat to the sands. The boat had never before been taken out and the hatches and tackle having been kept painted were stiff and

hard to handle. The boat was a splendid specimen of that class of craft and with its cargo of necessary accoutrements was heavy. By midnight we had the boat on the beach with life-line, cannon to shoot the line, life preservers, etc., all stowed away and ready to push off so soon as the tide should serve. It was yet four hours before we could expect the tug to heave in sight which would be about day-light. We could do nothing but wait and think of the imperiled men twenty miles away. The storm was gradually increasing and the roaring of the surf and the shaking of the island was calculated to disturb weak nerves. The clouds were flying overhead like frightened gulls and occasional gusts brought snow and rain. Surf was thrown completely over the island and even dashed against the lenses of the light more than one hundred feet above low tide. As the time drew near for manning the boat, our faces when shown by the light of the lantern exhibited no levity. Desmond, the keeper of the station and ex-officio captain of the crew, appeared to be nervous and frankly admitted that our undertaking was a perilous one. Charley Getty, George Wilson, Andrew Jackson and the others whose names I have forgotten were men of experience, courage and good judgment and I was the only one who had never had any experience in the surf. My initiation promised to be more than ordinarily interesting. I had confidence in the "boys" and while not wholly placid I put on the best face I could and would not have balked under any circumstances. As the time drew near we examined the lashings, put on our life suits, assumed the stations assigned to us and "stood by" ready to receive orders. We were instructed to stand at our places and with our oars on the sands to steady the boat and when word should be given, to drop to our seats and shove off. The boat's nose was kept on the sands and its stern out toward the channel. Just to the south of us not over seventy-five feet away was a dyke reaching out into the channel, cutting it half in two and standing from ten to twenty feet high. Over this the sea was breaking like a Niagara. As the tide rose and the boat began to float she would rise to the swell until all hands were put to their best efforts to hold it. Then it would sink back until it rested on the sands again only to repeat its upward and downward motion time and time again. We were drenched to the skin, the channel was a seething mass of foam, and the roaring surf drowned our voices except when raised to the highest pitch. Charly Getty and the captain each manned a steering oar and sat in

the stern. I had the port bow oar and the others were arranged in their places when the command was given to shove off. I shall never forget that wild plunge. The seething waters caught us and hurled us with the force of a catapult under the suspension bridge and out into the roaring surf beyond the island. The water was breaking in thirty fathoms and the waves were rolling tumultously. Great combers glowing with phosphorescent light seemed miles in length. As a huge breaker rose before us the order to back on our oars was obeyed with alacrity and we'd back away from it until it broke and then rush forward again into the foam and swirl. And thus, for two hours, we backed and filled among breakers that are noted the world over for their violence and volume. The cannon broke its lashings and threatened to make a hole through the boat in its wild plunges from one side to the other. Two men were ordered to haul in their oars and secure the gun. They could hold it but could not lash it and the crew was weakened by losing two of its oarsmen. The captain turned us toward a bight in the island for the purpose of running ashore and "trimming ship." As we neared the beach the port bow oar was ordered to "stand by" and take a line ashore as soon as her nose should strike the sand. That order was for me. I drew in my oar, caught up the line and standing in the bow made ready to jump as soon as I should feel the boat strike. The moment came just after a great roller had drawn back to sea and the succeeding one was coming in. I plunged forward into the water waist deep only to be caught by the incoming roller which was not less than ten or fifteen feet high. It caught me up and threw me forward fully fifty feet. I was completely submerged but fortunately retained presence of mind enough to hold onto my line, dig my heels into the sand and throw myself head first toward the shore. The returning roller left us high and dry on the beach and all hands were ordered to secure our cargo. The tug had not yet come in sight and as we were again on the island and not far away from the station the captain made an excuse to go there for something. We put everything in trim and waited for the captain, knowing that the tug would soon come over the bar and whisle for us. After half an hour and no captain I took another man and went to the station to ascertain the cause of delay. We found him snugly esconsed by his stove and in answer to us he declared that all the money in christendom would not induce him to go out in that surf again. Here was a problem. A man who

claimed to have been at sea all his life and who had been intrusted with the responsibilities of life-saving keeper, on the first occasion of his services being called for, and in the most critical moment showing the white feather when his crew of volunteers were clamoring to do this act of humanity and mercy. We begged, entreated and finally threatened, but all to no purpose. Going out again we saw the tug a mile away and by the steam from her whistle, knew that she was blowing for us. We secured another (smaller boat), from the light-keeper, a boat that leaked badly, and sent two men off to the tug to announce the situation and ask the captain to send the tug's boat in with the crew that had volunteered and we would meet them with the life-boat. This the captain refused to do. The trip out in the little leaky boat in such a surf was a very dangerous mission, but these two were very brave men, and it was our purpose to try and take the boat out to them ourselves when we saw with astonishment, the tug turn deliberately in and disappear over the bar. It looked like a shocking piece of cowardice in all concerned. We knew, however, that the captain of the tug was no coward, but up to this day there has been no satisfactory explanation of the act. All on board the steamer Tacoma were saved by fishermen, except eleven who clung to the rigging until the ship broke in two and keeled over. They clung there for two days and nights and being benumbed with cold, half starved, half drowned and completely exhuasted, they dropped one by one, were washed ashore and buried. The fishermen of the Umpqua performed such feats of daring and mercy as we sometimes read about and if the life-boat had reached the wreck every life might have been saved. Desmond ought to have gone to prison for the remainder of his natural life, but as it was, after several days' investigation, he was simply relieved of his position.

This little story seems hardly apropos to the purpose of this book, but it tends to show the relentless energy of this great force, that since the waters were gathered in the hollows, has been shaping islands and continents and changing the face of nature.

Chapter XIII.

THE SEA IN A TEMPEST—THE UMPQUA RIVER AND VALLEY.

"The breaking billows cast the flying foam
Upon the billows rising—all the deep
Is restless change—the waves, so swelled and steep,
Breaking and sinking; * * *
Curled as they come, they strike with furious force,
* * * * * *
Raking the rounded flints, which ages past
Rolled in their rage, and shall for ages last."

My memory is a storehouse of many incidents in experience and associations about Coos Bay, fishing, hunting and boating. Some are incidents humorous, incidents sad, incidents on land and water; incidents political and others of a social character which, while the narration might be made entertaining would not aid the purpose of this volume. I will therefore pass over them and ask the reader to accompany me up the beach twenty miles to the Umpqua river by stage, thence by boat to Scottsburg,the head of navigation on that stream, from whence, by stage we will reach the S. P. railroad at Drain sixty-five or seventy miles inland. I will select one of the many trips I have made over that route and give it in narrative form.

During the winter of 1883-4 Gen. J M Siglin and I fixed a date to go out in company. The stages that were driven up the beach were what are known as "beach wagons." The tires are very broad on account of having to be driven over the sands. The start had to be gauged to suit the tide for our drive would be directly on the beach, from which, if we were caught by the incoming tide we would be driven into the sand hills. Our start was just before daybreak from Empire where the bay is about two miles wide and had to be crossed in a small boat, the stage barn and horses being on the other side. The morning was cold and stormy and a heavy sea chopped the bay into a rough boating proposition. Jarvis, the good-natured driver and proprietor of the stage line, was a down-easter, and knew how to handle a boat. We were on hand with storm coats and full conviction that we would have a rough trip.

The boat was heavily loaded and now and then would take in a sea that required one of us to keep bailing. Spray was constantly blowing over us and by the time we had landed at the barn we were drenched to the skin. A twenty mile drive up the beach under the circumstances was not a pleasant experience to contemplate. We were in for it however, and were not of the kind to "gig back." At the barn we found three more passengers waiting for us; two men and a woman; one of the men being a drummer. From the barn there was a drive of about two miles over the sand dunes before we reached the beach, and being wet and chilled the General and I started out on foot. We reached the beach and traveled along it two or three miles before the stage overtook us. The weather was so heavy and thick that we could not see to the outer breakers. The wind blew a perfect gale from the northwest and the waves were running monstrously high and when they struck, even at low tide, almost covered the beach to the sand hills. If the tide should turn before we reached the Umpqua we were sure to be turned off the beach, which would mean a wait out in the bleak sand dunes until the tide should ebb again. The storm had been on for two or three days with a heavy swell running in, gaining in volume and violence as the storm increased. A wilder sight can not be imagined than these great billows breaking a mile off shore and rushing in in a swishy roar in acres of moving foam. Many kinds of sea life had been thrown upon the beach, squid, devilfish and great jelly fish two feet across were stranded, wriggling and writhing to avoid the attacks of sea gulls, fish hawks and eagles that at such time are attracted in large numbers. Some of the devil fish (polype), were three feet long with arms two feet or more in length provided with suckers by which they fasten onto and secure their prey. They are vicious looking creatures and are well named. The brute has a beak like an eagle's and as sharp as a keen edged knife. His eyes are the most vicious looking orbs with which any living thing has been endowed, and in his native element is not a desirable creature to meet. There were thousands of these. The day before our trip the driver had discovered a whale about thirty-five feet long that had ventured too close to shore and had been thrown out by the surf. He appropriated his find and afterwards rendered it up and obtained over a thousand dollars worth of oil. It was lying on the beach as we came up and gave us an excellent opportunity to examine the leviathan at close quarters. Sea lions are sometimes

thrown ashore in this way. A large one will often weigh a ton or more and is considered a valuable find. Four or five miles before reaching the Umpqua river Ten Mile creek has to be crossed. When the surf is low and the driver can venture far enough out, where the sands are beaten solid by the waves, the crossing is safe, but when the sea is running as we found it it is necessary to keep well up on the beach and the danger is that one will get into the quick sands. That was our misfortune on this occasion. Our progress had been slow and the tide was turning when we reached the stream and the surf prevented us from keeping far enough out to avoid the danger. These sands shift from time to time and are always unsafe. There were five passengers and the driver and we were told that the crossing did not look safe and that we should be prepared to take to the water if things went wrong. The stream was about one hundred yards wide and we could see that a strong current was running toward the middle of it and that it was thick and dark with moving sand. We got along all right until we approached the channel where the horses commenced to sink in the sand. The driver, passing the lines to the drummer sprang out and called the General and I to do likewise. We jumped into the water waist deep and pushing at the rear end of the wagon assisted the horses who, after a plunge or two, went into the newly cut channel in water that ran across their backs and they were in danger of being washed out to sea. The other man had jumped out as we did and was also pushing at the end of the wagon. As it went into swimming water he held on, Jarvis, Siglin and I let go. The horses after some swimming and plunging reached the opposite bank and climbed out. Our friend who had held onto the wagon trailed over like a tar bucket. The drummer whipped up and finally got out of the stream leaving three of us on the other side. Now the question was how were we to get over. We did not dare to stand where we had parted with the wagon for we were in the treacherous sand, and by the time we had found solid footing we were almost out of hearing from those in the wagon, the surf kept up such a roar. Jarvis, however, succeeded in making them understand that one of them was to bring the wagon back to us, keeping as far out in the surf as possible. The drummer balked, but the man who had been dragged over and was already thoroughly soaked, and being a man of courage, took the lines, unloaded the woman and drummer and keeping as it appeared dangerously far out in the surf succeeded in reaching

us. Returning we kept as far out as we dared to, and though one roller broke clear over the wagon, we got over and had a race with the tide until we reached near enough to the Umpqua river to make it safe to tackle the sand hills. By unloading the passengers the team was able to wallow through the loose sand to the boat landing. Through it all the drummer kept cool but perspired copiously and in good semitic language, embellished with commercial jargon heaped imprecations on the whole business. One must have an experience of this kind before he can fully appreciate what the strenuosity of a twenty-mile trip directly on the Pacific beach means on a windy, wintry day just at the tail end of a long storm at sea. The unceasing clatter of gulls, the screaming of fish-hawks and the threatening swoop of great eagles, the beach lined with various kinds of life from its depths, swept out of their element, the constant roar of the huge billows, and sweep of the surf and the darkness —which is unlike any other darkness that is experienced with old Sol overhead—gives a kind of uncanny aspect to everything.

Our little steamer lay at anchor a hundred yards off shore just in the mouth of the river bobbing up and down in the rough water like a bob on a trolling line. We were taken aboard in a small boat, a performance that never fails to unsteady the nerves of the land-lubber, in such weather. All were safely put aboard and the little propeller turned its head up river into the bay which is two miles wide and where the seas run high enough to induce sea sickness. About six miles from the landing we rounded into the wharf at Gardiner, a saw-milling and salmon-canning town. The lumbering business here is the chief occupation, although some coastwise traffic in freight is also done. Deep sea craft load here for various parts of the world and some freight to the interior is unloaded here and products from hence shipped away. Splendid forests lie back of the town and it presents a lively and an enterprising appearance. In the early days freights for the Umpqua valley and other points interior was unloaded here and products from hence shipped away. From this point navigation is good for something over 20 miles to Scottsburg, but not above that. Many years ago a steamboat was taken to Roseburg, an incident intended to be used in an application to Congress for an appropriation for improvement of the river to that point. The steamboat failed to get back, and the purpose for which it was taken there failed also. From Gardiner to Scottsburg the river is very interesting. The

mountains come down to the water with a steep even slope, leaving no margin for settlement. In coming up the river on this occasion we who had gotten soaked on the beach spent most of our time in trying to get dry in the engine room. At Scottsburg we remained until four o'clock the next morning, when we boarded the stage for Drain, thirty-six miles away, the nearest railroad station. In good weather this is a delightful ride, but at that time, in an incessant storm, muddy roads and damp clothing, the reader can imagine that our comfort was not excessive. The road runs along the lower Umpqua valley, which besides being very rich and productive, lies in a most attractive setting. The mountains break away on either hand decorated with a beautiful growth of oak, maple, ash, cedar, pine and fir. The valley has splendid growths of oak, interspersed among the farms, making it look like a park with the beautiful river running sometimes along its margin, and anon through its middle. The farms and improvements are all well kept, the orchards, gardens and stock show thrift and contentment. From Elkton to Drain is fourteen miles over a mountain of moderate elevation, a part of the time along the side of a very deep canyon. The road is a mere bench cut around the side of the hill at a dizzy height from the bottom of the gorge. The driver, like most of stage drivers, liked to indulge in the stories of accidents that have happened from sliding off the grade, and runaways down the hill. On this occasion he entertained us with an incident of a few weeks before that happened to him. He had as passengers, ex-Governor Whitaker and Judge Kelsey, both well known and prominent men and old pioneers. They were both great jokers and well acquainted, but like many other jokers could not relish a joke on themselves, and as they had been joking each other pretty hard they were each in some warmth of temper. The driver was listening and grew a little careless when at the most critical point of the grade his team shied and upset the stage down the hill. There were some trees against which the stage hung up. The slope was as steep as the roof of a house and the two pioneer politicians started down the slope in a very unconventional way. Kelsey succeeded in colliding with a tree before he got fully under way and turned to look for the Governor, who was headed down hill on all fours and making wonderful time. Kelsey called at the top of his voice, "come back you d——d old fool, you'll got lost!" The Governor succeeded in stopping himself, the stage was righted, but little damage was done, the passengers crawled

in and they proceeded in silence. The Judge was inclined to be talkative but the Governor was too indignant to answer him.

Late in the afternoon we reached the station and enjoyed that peculiar sensation only known to those who have had two strenuous days of such travel as belonged to long journeys during pioneer experiences. Our present troubles were over and a little comfort was at hand which we enjoyed to the fullest, notwithstanding the fact that we would have to make the return trip in a few days and in all probability would again suffer tribulation. One is not fit for pioneer life who cannot follow the scriptural injunction, "think not of the morrow," so far as worrying over probable future hardships is concerned. In fact these experiences and adventures constitute a very interesting picture gallery, which, during the remainder of life can be called up and looked over at will; the old masters have painted nothing as good, and J. P. Morgan's great picture collection would not be accepted by me in exchange for my own, if the exchange could be made.

Our present occupation is an examination of the old Siskiyou island, therefore we will turn south from Drain on the Southern Pacific road to Grants Pass. The probabilities are that we are beyond the limits of the Old Island, though I believe it extends as far north as the Umpqua river at Scottsburg, and there are some indications of it in the valley of that name. We will not theorize upon this but will view the valley and leave to the Geological Department the duty of settling the question of its age.

From Drain to Roseburg, the county seat of Douglas county, is forty miles, and the country, in appearance is not like any other part of Oregon. It is not properly a valley, but a great plain dotted over with hills and mountains of moderate size, without regularity or order. As a rule these hills are timbered with pine, fir and cedar on the north slopes while the southern slopes are provided with beautiful oak timber standing in groups and groves, or singly upon a smooth grass covered acclivity which in many places has been cleared of the trees and put in cultivation. In other places these southern slopes never had any timber but were found by the first settlers enchanting spots of splendid soil, usually a clay covered everywhere with excellent grass and decorated with a great variety of flowers that filled the spring days with fragrance. Where these hills are not too steep they are cultivated to the top on the south slopes and produce great crops of cereals and fruit.

Between these hills lie the valleys, many of them several miles in area and supporting a good population, while others seem to have been made for a single family. Across the Umpqua valley from Drain at its north to the mouth of Cow creek canyon at its southerly extremity, is about eighty miles, as traversed by the railroad. The county is bounded north by Lane county, east by Lane, Klamath and Jackson, south by Jackson and Josephine and west by Coos and the Ocean. It reaches to the summit of the Cascades on the east and much of it is high, mountainous, heavily forested and picturesque. The Umpqua river rises in two sources, the north Umpqua in the Cascade mountains in the northeast part of the county flows by a general westerly course with a slight southern trend. The South Umpqua rises also in the Cascade Mountains to the southeast and has its course westerly and northwesterly to a junction with the North branch a few miles northwest from Roseburg, thence westerly by a sinuous course to the ocean. Both branches are beautiful streams of clear, cold water. Roseburg stands on both banks of the South Umpqua. This little city is one of the oldest in Southern Oregon and is a place of wealth and importance. Its site is a picturesque one, and it is surrounded by fine farms and orchards. It is the site of the Soldiers' Home for the state, which is located a mile and a half westerly near the river, and has been worked into a bower of beauty.

If we were writing a civil and political history of the state, Roseburg and Douglas counties would furnish several interesting chapters. Here was the home of Gen. "Joe" Lane an Indian fighter, the first Governor of Oregon and United States Senator, who resigned that position at the breakout of the Civil War, because of his sympathy with the South. He was candidate for vice-president in 1860 on the ticket with Breckenridge and was for many years a prominent and picturesque figure. Though out of sympathy with a majority of the state, in that great crisis, in all other matters he was held in high esteem. He raised here a large and intelligent family, several of whom have honored positions and all of whom have held the respect of their fellow citizens. Judge Mathew P. Deady, so long U. S. Dist. Judge of Oregon was, also a resident of the county in the early days. Judge Deady gained a wide and honorable distinction as judge during the many years that he held that office. No man ever maintained a higher judicial dignity, or left more valuable decisions than he. J. F. Watson who served two years as United States District Attorney and

several times as Judge of the Second Judicial District of Oregon and his brother E. B .Watson, who served on the Supreme bench of the state were raised in this county. Roseburg is, and since his boyhood has been, the home of Binger Herman, several terms a member of Congress and for many years Commissioner of the U. S. General Land Office.

But, as has heretofore been said, I am not writing either a civil or political history, and must omit this interesting subject. As will be surmised from what has already been said, the valley has the general shape of a palm leaf spread out, with its stem lying along the river to the ocean. Many streams come from the high mountains all converging and flowing into the Umpqua river. Along all of these streams are margins of rich land which have been appropriated and are generally in a good state of cultivation. The great numbers of little valleys, nestling among the rounded grass-covered hills make it a very picturesque county, almost unique. Many of the richest farms and orchards of the state are found here and in the southern part of the county considerable mining is done. Besides its splendid forests of pine, fir and cedar, it also has great wealth in its oak, ash and maple. Its principal towns along the railroad to the north from Roseburg, are Oakland, Yoncalla and Drain, the last mentioned place being the site of one of the Normal schools of the state. I must not fail to mention Jesse Applegate and Chas. Applegate who in the early days settled at Yoncalla. The Applegate family was large and in the pioneer history of the state the Applegates were among the most important factors. Perhaps Oregon has never had a stronger mind than that of "Uncle" Jesse Applegate, as he has been familiarly called. His life and history would fill a volume, and the history of the state could not be written without it. "Uncle" Lindsey Applegate, also a brother, whose home was at Ashland, had a no less distinguished career and honorable record, whose sons, as well, have added many interesting chapters to the history of Oregon. But I must resist the temptation to digress into historical matters. Along the railroad south of Roseburg are the important towns of Myrtle Creek and Riddle. Near the last mentioned place is an extensive and valuable deposit of nickel. One of the chief products of the valley is prunes. They thrive to perfection and are shipped by the carload. Hops are also produced in large quantities on bottom lands. As before stated, the soil is largely clay among the hills, but in the bottom is a loam. Many

of the hills and depressions are gravelly, but even here, as a rule, apples, pears and prunes do well. The climate is a medium between the more humid one of the Willamette and the dryer one of the Rogue river. For its geology, which shows less age than the Rogue river, I must content myself with referring the reader to Professor Condon's "Two Islands," before mentioned, though it is a great temptation to go into its sandstone deposits and bring forth the interesting records found there. On our journey south a few miles beyond Riddle, we plunge into Cow Creek canyon, one of the most picturesque stretches of road along the line of the S. P. The canyon is very deep, the mountains extremely rugged and the stream very crooked. No lover of nature can take a run of twenty odd miles through this canyon without having his enthusiasm aroused to the highest pitch. One cannot avoid admiration of the engineering skill and courage that has been displayed here by the builders of this scenic road. At West Fork we see the last of the Port Orford cedar, and what we see here is of a young growth. It is being rapidly exhausted within reach of the railroad by the demands made on it for telegraph, telephone and electric light poles. They are the finest in the world without doubt or exception. At the head of the canyon we pass Glendale, a town rapidly growing into importance because of the forests near it and the mines that receive supplies from the station. A short distance out of Glendale we enter Josephine county, and a run of sixty or seventy miles over a mountainous country where there are extensive mining and lumbering interests, brings us again to Grants Pass, from which point we will revisit the Greyback region of the Siskiyous, and make the promised exploration of the Great Josephine County caves, which will be heareafter designated as "The Marble Halls of Oregon." Before making these explorations, and in pursuance of a promise made in a previous chapter the succeeding chapter will deal with "Lime and its uses in Nature." I assure the reader and believe he will agree with me, that the denudation of these mountains of their lime and mixing it with the deposits of the valleys, have been a great factor in constituting the unusual richness of the soil. Permit me also to say that the reader who has never made a special study of lime has never learned his relation with the material things about him. I therefore beg him to read it before he enters the caverns that nature has so wonderfully carved in the limestone beds of these mountains.

Chapter XIV.

LIME AND ITS USES IN NATURE—CAUSES OF THE LIMESTONE CAVERNS WHICH WE HAVE YET TO EXPLORE.

"I am a part of all that I have met."

We are about to explore the "Great Marble Halls of Oregon" and inasmuch as they are excavated in the mountains by forces nature has provided, and seem to have been deposited for a purpose, our study would be incomplete, did we not examine somewhat closely this important element.

Lime has been one of the greatest record makers in the unwritten history of the world's progress, from the first appearance of animal and vegetable life on earth, if. indeed not the chiefest employed in that round of evolution, which has constantly improved on the past. It is the most useful substance known to man in the mineral kingdom. Its uses are almost innumerable, but we will only deal with a few of them. Nature uses lime extensively in all forms of life, both animal and vegetable. It is not readily soluble in pure water, but is so in water charged with carbonic acid gas. During the dry seasons and immediately after the early rains, the atmosphere becomes charged with carbonic acid gas, which being absorbed and carried down with the rain furnishes vitality to vegetation, and percolating into the soils finds its way into the cracks and fissures of the earth, acting first upon the soils, then upon the rocks in its way. When the water thus charged comes into contact with the limestone bodies, such as it will soon be our business to examine, its solvent properties at once commence active operations; cutting and dissolving and forming what is known as the carbonate of lime. If in its travels it reaches great depths the pressure is also great, which enhances the transporting power of the water: i.e., enables the water to carry more of the lime than would be possible with less pressure. The solvent properties of the water are also enhanced by the pressure and more rapid cutting results. The magnificent caverns that we are to examine have thus been formed and the water carrying the lime in solution, finds an outlet to the surface, where being

relieved of the pressure, and an opportunity given for escape of the gas, much of the lime that has been carried in solution or suspension is precipitated; i.e, deposited along the banks or bed of the stream incrusting roots, trees and rocks, and where the conditions are favorable, building up some of the many wonders in lime, samples of which we shall see in the Marble Halls. If the water has been heated and carries a quantity of sulphur, the deposit formed will constitute what is known as travertine, of which I will speak more fully hereafter. A considerable quantity of the lime is still further held in solution and carried along with the stream for the enrichment of the soils along its banks, or deposited in the delta at its mouth. The great depth of sediments which has been described as forming the mass of Grizzly, has in this way acquired large quantities of lime and the erosion constantly going on, reducing these sediments to soils, furnishes the Rogue River valley with a soil enriched by this valuable product. We all know the value of lime as a fertilizer, and see in the operation of nature which I have just explained, one of its methods to vitalize and urge on vegetal growths, so essential to the existence and happiness of man.

Carbonic acid gas is essential to the growth of all kinds of vegetation, and for this purpose the atmosphere is kept charged with it. Without moisture the gas would be of little service, as it woud float above the earth, and in time would charge the atmosphere so heavily as to become dangerous to, if not destructive of all life, both animal and vegetal. Rains and atmospheric currents distribute it and keep up its proper circulation. We will assume that the wet season has just closed and the dry season commenced. The sun causes evaporation to take place rapidly; the moist surface gives forth its gases, of which carbonic acid gas furnishes a large part. After a time of warm sunshine there comes a shower of rain, the atmosphere is cleared and for a time seems to be washed and clean. The carbonic acid gas which had accumulated, is carried to the earth as I have explained, and having been saturated with water commences its round of circulation. Part of it passes again into the atmosphere as a gas and a part goes into the earth with the water as a solution, vitalizing first the vegetal mold, then carrying the surplus into the earth, where it combines with such minerals as serve its purposes best, which we find is lime. Thus we see the lime more widely distributed and deposited, giving off its gas which again commences its round of circulation. The lime thus

distributed is to be used again and again in taking up the surplus of carbonic acid gas over a wider range and extending the area of fruitful soils thus enriched. We will observe that evaporation is constantly going on over the surface of the earth and ocean, from which clouds are formed and the currents of air that carry these clouds in every direction over the earth, and the rains that come from them by which the same round is repeated over and over again. This is also in strict accord with the rythm of motion that is observed constantly and incessantly in everything that pertains to the universe.

There are other gases also, which are taken into the circulation of nature and do their part in this great plan, but we are now dealing with the uses of lime, and those elements that more nearly concern it.

Analysis shows that every variety of plant life contains a proportion of lime, and that all requires more or less of carbonic acid. I do not intend to say that the same proportion is found in, or is required by all classes of vegetal products, but that the amount required is found. The same is also true of animal life. Earthy matter consisting largely of the carbonate and phosphate of lime, soda and magnesia, fill the bone cells and give strength and rigidity to the bones. In children this is lacking to a certain degree, making the bones flexible and easily pressed out of shape. In old age the earthy matter is increased which causes the bones to become brittle and easily broken. The following table gives approximately the component parts of the bone structure in man and ox, to-wit:

In	man,	Gelatine	33.30	per	cent,	in	ox	33.30
"	"	Lime Phos.	53.04	"	"	"	"	57.35
"	"	Lime Carb.	11.30	"	"	"	"	3.85
"	"	Mag. Phos.	1.16	"	"	"	"	2.05
"	"	Soda & Salt	1.26	"	"	"	"	3.45

These proportions vary in different animals, but in all, lime either as a phosphate or a carbonate, furnishes the major portion of the bone structure. These are permeated with veins through which a circulation of blood and other fluids is kept up, and by which wasted tissue is renewed and bone structure supplied. It follows that the mineral substances necessary for such structure are supplied through the veins and must come from the food that is eaten. Whether the food is meat or vegetable it contains these necessary ingredients, that are first supplied to the vegetal world in the above described way. Carbonate of lime, so abundant

in the animal and vegetal kingdoms, is the main constituent of the shells of the crustaceans and molusks, and as we have seen, occurs plentifully in the bones of animals and men. Indeed it is an essential ingredient of all kinds of life, high or low, animal or vegetal. An examination of the earliest fossils shows that it played a larger part in the early ages of the earth's history than now. The combinations of lime with other elements were brought about by natural laws, new features and forms and greater fineness were evolved in the various subjects brought into existence. We must not lose sight of the carbon, which in the advancement of organic nature is the constant companion of lime, and without which the magnificent caverns which we are to examine would not have been formed and of these great lime deposits below the surface of the mountains would be lost to the necessary advancement of organic life. Without the carbon man would have been deprived of the benefits derived from these massive beds of fertilizing and revivifying materials stored away in the bowels of the earth. Carbon, then, is one of the essential elements by the means of which various mineral substances are utilized for the growth of living organisms. It is free or uncombined in graphite and pure in the diamond. It is much more abundant, however, in states of combination. United with oxygen it occurs as a carbonic acid gas in the atmosphere, in natural waters, in limestone, in dolomite and ironstone. In coal it is found combined with oxygen and hydrogen; and in animals and plants it is found as one of the elements in building up wood, starch, gum, bone and flesh.

So essentially useful are these elements when combined with animal and vegetal matter, or more properly speaking, when formed into such matter because of the properties we have been discussing and others not yet touched uponn, that man finds many uses for the broken fragments of these frames along the pathway of natural decay. For instance bones are largely used in purifying liquids, syrups, etc., etc. when properly prepared and also as deodorizers and fertilizers. In fact there seems scarcely a limit to the usefulness of these mineral substances, and when used over and over again, and almost innumerable compounds have been made from them and used for the purposes for which they were made, the residue is again handed over to nature's chemical laboratory where they are refitted for a new round of usefulness. Every day we eat of the bones and flesh and vegetables of prehistoric ages, and lime is

largely the vehicle by which these prehistoric feasts have been carried down the ages to us.

All of the constituents that enter into the composition of bones, are desirable additions to soils, and particularly the phosphates. Phosphoric acid usually found in combination with magnesia, but more particularly with lime, enters into the structure of every plant and animal; and can not therefore, be dispensed with, either in animal or vegetal economy. A study of ocean life shows that calcareous, i.e. chalky, or limy matter enters not only the fleshy and vegetal substances, but also into the bone, where bone is a part of the structure, and into the shell where such a shield or shelly covering is provided for the protection of the animal wearing it. It will also be observed that light and heat are indispensable to the development of animal or vegetal forms. Both light and solar heat are diminished by remoteness from external influences. Solar light and heat also depends upon the position occupied upon the surface of the earth. The most luxuriant growth of animal and vegetal life to be seen at the present time is to be found near the equator. There is also found the strongest light and the intensest solar heat. As the poles are approached we know that the heat and light diminishes, and so does the proportions of animal and vegetal life. This thought carries us back to the one already developed, that vegetal life depends largely upon carbonic acid gas for nourishment, and that animal life depends primarily upon vegetal life. We have seen that the generation of carbonic acid gas on the surface of the earth, depends on light, heat and moisture, and that its distribution depends, first; on ocean and air currents, and second upon percolation into the earth and the transporting power of water; and that from this it enters into the complex circulation of fluids and gases, and in animal life, into the circulation of the blood.

Now, when we realize the fact, that in order to give carbonic acid gas its greatest facility for the development of life, either animal or vegetal, it must combine with some mineral substance; and that lime is the substance with which it most readily combines for its greatest work in the economy of nature, we are preparing to follow it into further combinations needed by it in the prosecution of the work it has in hand. It used to be a favorite notion that phosphorus was in some way connected with the active working of the mind, and that fish, being rich in phosphorus furnished an excellent brain food.

The reader will remember that in a previous chapter I have given considerable attention to the mineral springs in the upper part of the Rogue River valley and elsewhere about the Siskiyou mountains; that I have given an analysis of one of the springs and spoke of the escaping carbonic acid gas and other gases connected with the springs, and of the great depth of sediment forming the mass of Grizzly mountain; and the extensive erosion of the Siskiyous, by which the greater part of the surface lime and other deposits were washed into the sea. These great beds of sediment and escaping gases indicate the character of the soils being formed, and that they contain the ingredients we are considering. They are among the strongest evidences of the great age of this old island and account for the peculiar growths and great fertility of the valleys of this region.

As we have seen, the bony structure of all animals including man, contains the phosphate and carbonate of lime, the phosphate predominating. The proportion of phosphates is greater in marine life than in that found on land, so far as the fleshy parts of the animals are concerned. This does not apply to the shells of such animals as are furnished with such covering, which are chiefly of the carbonate of lime. We see therefore that phosphoric acid and carbonic acid, are required in the economy of nature in combination with lime as a base, in furnishing vitality to organic life. Pursuing our study we see that the immense beds of limestone, covered deeply under the mountains and valleys, are largely composed of the bones and shelly covering of marine animals now extinct; and that these beds were temporarily withdrawn from use, to supply the requirements of after-ages. When we realize the fact that lime is so essential to the existence and development of organic life, and that so much of it is stored away, we may reasonably ask the question: from whence is the present supply derived, and how did these immense beds of lime come into existence as such? We will search for an answer.

These beds are not wholly due to the action of the elements on the uncovered portions of the earth's surface. In fact many of our most extensive beds of limestone show that they were formed at the bottom of the ocean, and only contain fossils of marine animals and fishes. Many of these beds may be traced to a coral origin, while others show the shells of mollusks and other denizens of the deep. The discovery of marine shells in the shales and sandstones of our highest mountains, shows that every part of this

globe has at some time or another been submerged beneath the waves of the sea; and all bear evidence of the important part that lime has played in the existence of organic matter, from the earliest appearance of animal life. I have already observed that lime appears to have been more extensively used in the early history of the earth than at present. This is borne out by the fact that life seems to have been more abundant then than now, and in form was more gigantic. I do not mean to be understood that there is less lime nor that it is in less use now than then, but that in the evolution of all material things, and the unceasing circulation, it has come to be more and more refined and more generally distributed. In the reptilian age, when this old island was surrounded by the ocean, the waters fairly swarmed with monsters, whose huge frames required immense quantities of carbonate and phosphates of lime. These frames are now being unearthed in the centers of the continents, and in almost all places far inland, and in their decomposition have added much needed fertilizing material.

As these limy materials have been extracted from their beds by the action of the elements and other causes, they have contributed their proportion to the streams that have carried them to the ocean, where nature's chemistry has been employed to restore them to usefulness by the revitalizing processes employed in its labaratory, which though being continually drawn from are never exhausted. These new beds may again, sometime, be found buried under mountains far inland, if the ocean shall continue to shift its position as it has done in the past, which does not seem probable, however. Then after undergoing metamorphic transformation they will be subjected to the same processes that we will see going on in the great marble caverns which we are preparing to explore, from whence in different combinations they will issue forth to renew and fertalize fields and valleys, now hidden from the sun, as these are now fertalizing the valleys into which their waters flow.

The ocean is the great fountain from which the lime gathers its phosphorus, while it draws its carbon from the rain that finds its way by percolation, through cracks and fissures in the rocks, long after the ocean has been removed to some other portion of the earth, and these limestone beds, once at the bottom of the sea have become a part of some continent or island.

So that in this we have marked out another source of

vital circulation, that is and for many ages has been evolving higher and newer forms out of the materials, which though they never die are constantly changing burial places; first at the bottom of the ocean, then in the heart of a mighty mountain. In this way they are repeating the round of all matter, whether of that we call animate, or that we designate as inanimate. Thus, though buried for aeons of ages in the bowels of the earth, or in the depths of the ocean, it means not death, but a renewal of life and strength by ages of rest and sleep, during which the elements employed are combining with the vitalizing forces of nature for distant enterprises, in developing higher and newer forms of life. The fossils now being deposited, including all forms of organic matter, will sometime in the distant future, perhaps, be to those who shall then live what the fossils of animals now extinct are to us, while the material will have been used over and over again, each succeeding process having a tendency toward still further refinement.

This branch of the subject is by no means exhausted, but not wishing to tire our readers, if any shall find patience to peruse this, we will hasten on to another topic connected herewith that ought not be overlooked, inasmuch as it will throw still further light on the subject of this volume.

It is reasonably certain that the earliest form of life on the earth was an algae, or sea weed. It is also quite certain that at that period the surface of the earth was in a state of great heat, as compared with the present temperature, and that only such life as is suited to such temperature could exist. As the cooling process continued, other forms of life suited to the changed conditions came into existence. Now if we find anywhere on the earth's surface conditions similar to those that prevailed in that distant past, and if there we find a growth similar to the growths of which I have spoken, and if it is at the present time thriving, we may study it with satisfaction and profit.

In Iceland, New Zealand, the Yellowstone National Park, and in some other places on the earth we find hot and boiling springs, all carrying various kinds of mineral substances in solution or suspension, and there we also find such growths as are suited to such conditions. We will only take what we observe at the Yellowstone, because it is a section within our own country, and because we will there find the phenomena in greater perfection than elsewhere, and on a more extensive scale. Here are the Mammoth Hot Springs ranging from one to two hundred degrees of heat as the water comes to the surface. From one

hundred to one hundred and eighty degrees we find algae growing vigorously. There are a great many of these hot springs and the volume of water is very large. About them have been built up basins of travertine of great beauty, consisting almost wholly of carbonate of lime with which the water is heavily charged. On close examination we find that the vegetable algae is one of the chief artificers in the construction. This growth is not found except in hot or warm water, and its growth is marked where the water has a temperature of from one hundred forty five to one hundred sixty degrees of heat. This growth seems to be spontaneous, for immediately where it is the hottest it grows best. This apparently spontaneous growth it would seem, is such in fact, or else the seed from which it springs comes from the same buried regions whence the lime is supplied. One is perhaps justified in speculating a little under the unusual circumstances. Is it probable that the limestone beds that are now being brought to the surface in solution, were formed in that early period of the earth's existence when its surface held only hot soils and hot water? If so then; was this character of growth indiginous at that time and at the place where the lime was gathered, and were its ripened seeds borne away on the water and deposited with and hermetically sealed in the limestone, and now being released again at the surface under conditions similar to those that prevailed at the time of its growth, i.e., under great heat, that they at once germinate and grow? If that suggestion is dsiputed I would like a more plausible one. If we suppose this to be true we have the spectacle of seeds being embalmed and preserved from the date of the earliest growths on the earth, and now being brought to the surface and freed under conditions of heat similar to that which prevailed when it was the only growth, it springs into life and exhibits to us the methods employed by nature in the very morning of the earliest vegetable existence. I know this thought will meet opposition from botanists and I will not urge it. But aside from speculation we have facts to examine which are most interesting.

This strange locality is doubtless the site of recent volcanic action, and the geysers and hot springs indicate great internal heat still prevailing. The mountains in the neighborhood show great and complicated foliation of stratified rocks, consisting of sandstone, shale and limestone which, in places is capped with basaltic lava, the result of volcanic activity since the stratified rocks were

laid down; practically the same as prevailed on Grizzly mountain. The interesting terraces, basins and other structures built up by the Mammoth Hot Springs, consist of the carbonate of lime and have doubtless left great caverns in the original beds, similar to those it is our purpose to explore presently. The manner of construction is as follows: As the heated water pours from its exit in the rocks, the algae commences at once to grow, attaching itself to the rocky bed where it strikes. Its growth is in a single fiber that shoots up toward the surface of the water. The vegetable fiber requires carbonic acid, which is contained in the carbonate of lime held in solution and is attracted to the fiber and as the water commences to deposit the lime it gathers about the growing fiber, building a tube around it. The fiber and tube grow together until the top of the water is reached when both stop and the vegetable dies at the top. While this one was being built up thousands more were growing up side by side in the same way and the spaces between the tubes were being filled with little pellicles of lime which were held in suspension, making a solid wall which would cause the water to rise as high as its outlet, and this wall describing the arc of a circle and connected at each side with the rocks of the mountainside formed a beautiful basin between the wall and the mountain. When the water has risen as high as its point of issue, it breaks over the growing wall and commences to build another basin below, and so on down the side of the slope, building beautiful white terraces and each terrace containing a basin of limpid hot water. These beautiful terraces and basin walls are tinted with bright colors, red and green, imparted by the contained vegetable, though for a long time it was supposed to be a mineral coloring. The further away from the exit, of course the cooler becomes the water, and the paler grows the algae, until we find it building no terraces nor walls but waving about in the current white and colorless, the water having lost most of its heat, and deposited most of its lime.

Along the banks of this heated stream there gathers a slimy deposit, like gelatine; such as is often seen in backyards during the wet weather; this comes from the steam and is a deposit of that which was contained in the water; brought from the depths where the earlier deposits of organic matter, both vegetal and animal, were stored away. Being at all times subject to additions from this steam it has its own growth and when stepped on or handled, it seems nearly to resemble the mass of which the jelly-fish

of the ocean are composed, but on examination it is found to be a vegetal growth also. When taken from the rocks where it has been deposited and has grown and placed where it will be exposed to the sun, the water which it contains is evaporated and there is left only a small residue of carbonate of lime, silica and other earthy matter.

We will now briefly examine the geysers of this same region some miles away. Here the hot water is at intervals thrown to a great height, forming large pools about them. This is called acid water, because it has been dissolving the acid rocks and holds the result in solution, as the other beds hold the lime, silica being largely the product held. Silicia is the material from which glass is made. Crystalized quartz furnishes the purest example of silica in mass. Now on watching the action of these geysers we will notice that a substance of gelatine is being collected about the outer edges of the pools, where it grows like the mother of vinegar. This is also a vegetable as the mother of vinegar is, and has a sour taste. This jelly-like mass is driven constantly toward the edges of the pool, until it becomes so dense that the water is forced to find an outlet, and breaks through at some point drawing the water away from this growth and leaving it to the mercy of the sun. The growth has taken root, so to speak, in the rock that forms the bed of the pool, or rather, it attaches itself to the rocks and grows like a toad stool. If while the moisture still continues in it, you step into the mass the sensation is the same as though you trod on a massive jelly-fish, the foot crushes through it. Now after the sun has evaporated the water from it, lo! we have another transformation; a stone of the character of opal, called silicious sinter, because silica is the chief ingredient. In the northwestern part of Nevada, in a sage plain, there is quite an area over which these bunches of silicious sinter are scattered, evincing the probability that here geyser action prevailed in the distant past. This silicious sinter, after it has been completely transformed, shows specimens that resemble a compact species of coral. An acid test shows the presence of lime also. Even in its solid rock state it has the appearance of a petrified fungus.

There is much more that might be said in this connection but fearing to tire my readers with that which, strangely it seems to me, fails to interest so many, I will not pursue it further, though a book might be written on the subject. I will, however, ask that you remember what I have said about this formation of silicious sinter and of

algaeous growth and jelly masses to which out attention was drawn in the neighborhood of the Mammoth Hot Springs, and the peculiar life we saw thrown onto the beach in our ride from Coos Bay to the Umpqua. We will further be led to a consideration of the uses to which silica and lime are put in the advancement of organic matter. This is proper for we are engaged in studying some of the most interesting things in nature.

I have referred to the cretaceous period and the reptilian age, as to the immense forms and character of animal life existing at that time. As I have said, the ocean then swarmed with animals of gigantic size and monstrous build. The fossils of that period show that many of these animals lived both in the water and on the land; great four-footed beasts that both walked and swam, some of them also added the skill of flying. An examination of these monsters show that many of them had a covering of shells and scales. Where the animal was covered with a shield of scales, the material contained a large per cent of silica, and those that wore shells had their shield of carbonate of lime. The Ptyrodactyl was beast and bird combined. From tip to tip of his wings he sometimes measured twenty feet. His wings were of leather instead of feathers, more like a bat than a bird. He had jaws and teeth like an alligator. His tail was an elongated vertebra with many joints and growing out at right angles from these joints were quills, more like those of a porcupine than a bird, with coarse spines which were then the nearest semblance to feathers to be found in all nature. As we trace these animals down to the present time we are struck with the gradual but steady changes that have occurred. The Ptyrodactyl has by degrees lost its massive size; his teeth and jaws have given way for a beak; his bat-like wings have been exchanged for the beauty and strength of feathers and feathers are made to cover his whole body. The scaly covering of most of the animals have been dropped and hair or fur have taken their place. A fair division has been made between the land, the sea and the air. There is less of war among them than in earlier times. Scales and shells are not now so necessary for their protection. There has grown more gentleness and civility, and more refinement both in form and manner, social instincts have been gradually evolved. The posterity of the Ptyrodactyl now covers the whole field from the Condor of the Andes, to the humming bird, that animated flash of sunshine and brilliant plumage that will draw a momentary feast from

the boquet you hold in your hand. All these changes and a million more have occurred, largely through the refining processes that we have been tracing, and which have been going on since these immense beds of limestone were laid down in the ocean, and while its surf was lashing the shores of this old island. At Ashland was an open roadstead and on its beach these animals fought and played.

Now if we examine the quill and feather of the bird we find their strength and flexibility come from the silica they contain. The nails on your fingers are very akin to the quill and the scale of the fish, ditto. The waters of the Mammoth Hot Springs and the Geysers both carry and distribute the mineral ingredients essential for both animal and vegetable life. The shell-fish have their covering of the carbonate of lime for protection, but no bones. Man and other animals have been furnished with other means of defense and need no shelly covering, but they have been provided with a framework of bones consisting largely of the carbonate and phosphate of lime.

If we examine the mussel we find it contained in such a shell with which it is so closely indentified that it is difficult to tell just where the shelly substance ceases and the flesh commences. It is made to cling to the rocks by means of a bundle of fiber more of the character of vegetable than animal. This bundle of fiber is made to pass through an opening at the knuckle of the shell and to connect with the flesh by such gradations that it is difficult to tell where the fiber ceases and the flesh commences. The barnacle has its covering of the carbonate of lime also with which it is so closely identified that separation kills the animal. The barnacle has a beak like a bird except that it is separated vertically instead of horizontally. It has small beady eyes and can move its head so as to describe half a circle.

The jellyfish, sometimes called the sunfish, is a mass of gelatine and resembles in look and feel, that vegetable substance we found along the banks of the Hot Springs and in the pools of the geysers. We saw thousands of these creatures along the beach on our trip from Empire City to the Umpqua; if you step on it there is little resistance and the foot crushes through it as it did through the vegetable jelly mass at the Hot Springs. If you place the jellyfish in the sun, the water will be evaporated and only a small residue of carbonate and phosphate of lime, a little silica, a small portion of common salt and earthy matter will be left, which if placed under pressure with heat be-

comes a rock. The same treatment of the flesh of all the shell fishes produce the same result. So that we have the same result from like treatment of either the vegetal or animal substances. All these forms come from the inorganic and under proper conditions become organic, and when the conditions are again reversed they return to the inorganic. Of course we cannot in this way trace or account for the vital fluid, or life germ, but we must recognize our kinship to all material things. We are made to feel that if we would follow the injunction, "know thyself" we must become students of nature.

Chapter XV.

THE MARBLE HALLS OF OREGON—EXPLORING PREHISTORIC WONDERS IN ETERNAL DARKNESS—INIMITABLE DECORATIONS IN CARBONATE OF LIME.

"Joaquin Miller, the Poet of the Sierras", the Hon. Jefferson Myers of Portland, and the writer, met at Grants Pass, Oregon, on the 3d day of August, 1907, enroute to explore the great caves of Josephine county, situated about forty miles southerly from that city, near the California line and in the heart of the Siskiyou mountains. The Commercial Club and business people of Grants Pass rendered us much assistance and extended courtesies for which acknowledgment should be made. To Mr. Andrews, the Secretary, we are especially indebted.

On the following afternoon Mr. Tom Gillmore, the liveryman, drove us to "Johns", a farm house hotel situated in the heart of Williams Creek valley about twenty miles away. They had been notified by phone of our coming and we found a royal supper awaiting us.

We remained over night and cannot soon forget it. The place is an ideal one. Farm houses, orchards, barns, well with marble curbing, flowers in profusion, the great mountains in the near distance sending down many streams of clear, cold water that lent its music to the stillness of the evening, and we occupying the center of one of the most charming little valleys in existence, together with the company, spirit of comradeship and perfect weather made this, our first evening out, a most delightful one. We sat on the porch in the cool breezes laden with the perfume of flowers, ripening grain and new mown hay, chatting with the hostess and her two daughters until near ten o'clock, and enjoyed the recitations the poet gave, sometimes of his experiences and travels and anon running off into sentiment inspired by his poetic fancy and surroundings. The little girls were in love with the venerable poet: they all are when such occasions and environment open the inner sanctum and reveal the real man. The week we spent together in the wilds, and which I shall attempt to describe, was one to be remembered. "Jeff" and I

are no less lovers of nature than is the poet, but were more liable to explode our admiration, while "Joaquin" effervesced. We were congenial and nature smiled on a trio of spirits that enjoyed and loved it.

The following morning dawned in splendor and our hospitable land-lady had an early breakfast, which in its quality vied with the supper of the evening before; fried chicken and many a delicacy. I cannot take time to describe this beautiful valley; a chapter would be required, and besides we have already viewed it from the summit of Little Grayback, in a former chapter. Our team was soon ready to drive us to the head of wagon navigation at the upper end of the valley, seven miles further on. Here we met John H. Kincaid, packer and guide. "Jeff" and I "hit the trail" and left "Joaquin" and Kincaid to follow. For the first five or six miles our trail was good, through a fine forest, with an occasional outlook over canyons and mountain billows. About noon we reached Grayback Creek, a rushing mountain torrent, and while awaiting the pack-train we tried to beguile the festive trout, but without success. Here we lunched, quaffed this clear, ice cold water and breathed deeply of the mountain air. An hour's rest and again the trail, this time all together. Our course was now west over Meadows mountain and for the first three miles was a strenuous, continuous climb up a steep ascent, until we reached an altitude of at least five thousand feet, thence downward for about two miles and two thousand feet lower, when we reached our destination, about four o'clock in the afternoon and about twelve miles from where we left the wagon. F. M. Nickerson had been telephoned to at Kerbyville to meet us at the caves, also to act as guide through the labyrinths. He came in about an hour later as hungry as a bear after a walk of twenty miles. He and Kincaid are, perhaps, the only men who are thoroughly familiar with these underground passages and we can heartily recommend them both.

These caverns were discovered by Elijah Davidson, while hunting bear in these mountains in 1874, he chased one into the lower entrance. The first effort at exploration was made in 1877 by our guide, Nickerson, Elijah Davidson and John M. Chapman, who entered at the lower opening, the upper one then being unknown. Homer and Ernest Harkness, two brothers, took a squatter's claim at the lower entrance in 1880. The land being unsurveyed they could not acquire title. During the next two years these two brothers spent about a thousand dollars in enlarging

passages between such chambers as they had discovered, so that they could be entered. They also built the first trail, but the country was too sparsely settled to make their enterprise pay and the day of tourists had not yet arrived. At that time the nearest point to the railroad was about two hundred miles. They became discouraged and abandoned their undertaking with a very limited knowledge of these underground palaces. In 1887 our guide Nickerson and A. J. Henderson took possession of the caves and incorporated a company for their further exploitation. They went about their work methodically and attracted the attention of "Captain" A. J. Smith who posed as the representative of unlimited capital. The "Captain" was surcharged with caloric and evolved hot air as a dynamo does electricity. The people in the nearby valleys became enthused and the "Captain" proceeded to action. He secured a bond from Nickerson and his partners, employed surveyors to lay out roads and trails; hired men to further explore and develop the caverns; bought provision and supplies, erected cabins and put gates at the entrances. These deep mountain recesses all at once took on the airs of a military camp and long accounts grew on the books of the nearest merchants. Mountaineers toiled and sweated a mile or more under ground, but the doughty "Captain" could never be induced to enter the dark chambers that were being opened up. Devious and various methods for staving off creditors were resorted to. In this way, month after month his liabilities grew until he had incurred indebtedness for labor and supplies to the amount of several thousand dollars and then the "Captain" disappeared. Kincaid and Nickerson thus put in many weary months in the bowels of this great mountain and for more than a dozen years have been whistling for their pay, and praying for the rest of the "Captain's" soul. This is the way they learned the labyrinthine mazes of these Marble Halls, miles under ground. Such is the story as told to us. Our guides long ago earned the fees they get for acting as guides and are past masters in the art of tracing these dark passages.

There are two entrances, one almost at the bed of the canyon, and another about three hundred feet higher and between a quarter and a half mile to the southeast. The lower entrance is the larger one and is the outlet for a fine stream of water, which immediately after escaping from plutonian darkness, commences a series of leaps and plunges down a rugged canyon through one of Oregon's finest for-

ests. Entering this opening with lantern and candles, one of the guides ahead and one behind, we proceeded up the stream by a tortuous course for about a hundred and fifty yards where we found a ladder. To this point the cavern is fron ten to fifty feet wide and from fifteen to seventy-five feet high. There are but few decorations, but a sense of rugged grandeur absorbs the adventurer. We mounted the ladder to a narrow shelf twelve or fifteen feet above the stream, which we could hear gurgling on merrily below us, a long narrow crack or fissure extending down to it. From the entrance to the ladder the Poet named "Watson's Gorge" and I bowed to the compliment. Our course for hundreds of yards further was devious, and recognizing the strenuosity of it "Jeff" named it "Roosevelt's Rough Ride." Our course lay through cracks and fissures, narrow, crooked, with angular turns, sometimes opening into chambers of considerable size, with narrow passages leading away in the darkness. At one time, Nickerson who was leading, became confused and wandered about, chasing weird shadows first into one passage then into another. Kincaid's little dog follows him every trip into the caves and at once indicated his canine sagacity by dog talk punctuated by erratic movements of his stubby tail, and turning into another passage said as plainly as a dog could, "here, you fellows, this way," we followed and found that the dog was right. This place we called "Paradise Lost." After something like half a mile of wandering through these narrow ways, we ascended sharply over irregular broken fragments and saw light through a small opening. We squeezed through and found ourselves in a good-sized chamber just inside the upper entrance.

We were now at the threshold of that wonderful labyrinth of halls, corridors and chambers, cut out of marble by the action of water charged with carbonic acid. This is not a great cave or cavern after the style of the Mammoth Cave in Kentucky, but a great marble mountain honeycombed with innumerable passages, halls, corridors, and chambers, decorated in the most gorgeous fashion with an inimitable architecture in crystals of the carbonate of lime. The Mammoth Cave in Kentucky is great for the size of its chambers, but is emphasized poverty as to its adornments. This mountain is a labyrinth of chambers from a few feet in size to others of great dimensions, and all decorated in endless profusion and beauty. From the great number and complexity of its chambers, corridors and passageways, the Poet suggested, and we heartily sec-

onded, a new name: "The Marble Halls of Oregon." It is to be hoped that this name may be adopted by some suitable and formal action.

Proceeding from the upper entrance our general direction into the mountain is to the southeast for a mile and three quarters to two miles and our course is a very erratic one. From the entrance our descent is sharp for about seventy-five feet, where stalactities and stalagmites first appear. Turning now to the left a still further descent of about fifty feet brings us into "Adam's Tomb"; gray and somber, with strength rather than beauty depicted in its adornment. There is no water dripping in this chamber, hence it has a desolate, dead appearance and musty odor. At the southern edge of this chamber is a dark forbidding hole which the guides call "Jacob's Well." Kincaid fearlessly clambered into it and we followed, clinging to rocky projections until after a sheer descent of forty or fifty feet we came into a chamber, irregular in outline, about one hundred feet long, from ten to fifty feet wide and from fifteen to fifty feet high. Everywhere in this room the decorations are splendid for strength and regularity of design and are unlike any other chamber visited by us. Returning now to the main passage above, we proceed for several hundred feet through a corridor, irregular, swelling here and there to goodly proportions and anon contracting until stooping and crouching are necessary, but at every turn and angle the explorer is made to utter exclamations of surprise at the eccentricities displayed in the architecture of these Marble Halls, growing in endless night for millions of years, yet displaying the most remarkable tracery and design. Each of these chambers were given names suggested by some peculiarity of structure displayed. "The Shark's Head," "Queen's Chamber," "King's Hall," "Niagara Falls," "Joaquin's Rest", "Nick's Bedroom," "Jefferson Myer's Room" and many others. We pass on through this irregular corridor and in one of the narrowest places find a ladder and descend about eight or ten feet into a chamber well decorated which, having passed through, we climb out by means of another ladder twelve or fifteen feet high and come into "Windy Passage," where a strong current of air threatens to extinguish our candles and sometimes does so. This passage is long, sinuous and small, sometimes requiring one to crawl on hands and knees. Then we come into the "Theatrical Stage", with gorgeous curtains and draperies, fluted columns and marble pedestals. Here any one may sing and it will sound musical. Even

Jeff and I sang a duet with stunning effect. With a piece of metal one can run the scale on marble crystals pendant from the ceiling and produce tones of exquisite sweetness. Next we come into "Joaquin Miller's Room". This is one of the most profusely decorated chambers in the whole labyrinth, stalactites and stalagmites are in profusion, long slender tubes as clear as glass, not larger than pipe stems and so fragile that great care is required in handling them. A broad table projects from the wall four feet above the floor, about twenty feet long and about six feet wide, with drapery long and delicate, snow white and glistening, reaching from the table to the floor, and except in one place, preventing ingress to the museum of beauties beneath. There is a marble basin filled with water, so clear that its presence is not easily detected. This basin is lined with the most delicate, frost-like crystals, so fine and filmy that with your finger you can plough a furrow through them. Looking beyond this little crystal lake, these delicate tubes, pedestals and statuettes, continue as far as your glimmering candle will permit your vision to penetrate. These beauties are protected from that vandalism which has shamefully desecrated many of its chambers. Above the tables are shelves of like character. Here the Plutonian designer has taxed complexity and confusion in stocking a unique toy-shop. Give imagination a little play, distribute your lights properly and then catalogue the infinite variety of trinkets you will see in this old curiosity house. In other parts of this splendid room are stalactites from the top, wedded to stalagmites from the bottom, forming pillars from ceiling to floor as if placed there to support the roof. We had some railroad fuses, red and green which when lighted burned for ten minutes. We lighted one in this chamber and placing the venerable Poet, with his long hair and flowing beard, in the background, retreated down the corridor a hundred feet or so and watched the startling effect. The uncanny red glow slowly filled that wonderful place with a wierd effulgence. The Poet looked like Father Time calling the world to judgment. Every pend- and crystal seemed tipped with fire, and crystalline masses in the deep recesses were suffused with a colored glow and brilliancy not to be described. "Nick's Slide", a slippery chute, barely large enough for a good sized man to squeeze through, extending downward for about a hundred feet with a hole at the bottom, said to be two hundred and fifty feet deep, was near by. We had been at the bottom of the slide, and now, in the effulgence of this rose tinted light

with a thrilling sense of our unusual situation, we nervously glanced at it, feeling it to be a fitting time and place for Old Nick himself to appear from the greater depths where His Satanic Majesty might find a suitable abiding place. The chamber soon filled with smoke tinged as all else with the red glow; the light began to fade and in the dissolving view the luminous glamour blended with the darkness and Pluto dropped his dark curtain on our strange entertainment.

From this point our course bore southerly for about three hundred feet through a great corridor, fifty or sixty feet wide and from twenty to forty feet high. This led us into what has been called the "Ghost Chamber," renamed by us, "Solomon's Temple." We could only guess at the dimensions, but our guides told us it was three hundred and fifty feet long, one hundred and fifty feet wide and eighty feet high. The floor of this great room is about forty feet below the corridor through which we had just passed. The descent to it is over irregular masses of marble that have fallen from the top. There is not much of decoration here, but the magnitude, darkness and stillness gets onto ones nerves. Along the further wall of this great cavern we again came upon our stream and named it "The Stygian." Here was a very interesting change. The stream had cut a channel four or five feet deep through a bed of clay and washed gravel upon which the marble deposit, at this place seems to be bedded; yet it can hardly be seen for reasons I need not now state. The floor in the furthest end of this great chamber reached by us, is covered to a considerable depth (how deep we had no means of determining) with this bed of clay and gravel, frosted over with a coating of the carbonate of lime (stalagmite), from one to three inches thick, the underside of which consists of delicate frost-like crystals, discolored to a dark yellowish brown from the clay and the iron oxide it contains. I desired very much to make a close examination of this clay and gravel but was not prepared to do so.

At the eastern end of this great room stands a ladder eighteen feet long, resting against the solid marble wall. The ladder did not seem to be safe for the heavier men, but Kincaid suggested that I could make it if I wished to take the risk and that it was well worth while. The guides never tell you what you are coming to, but leave you to enjoy the sensation of surprise. I at once agreed to follow, saying that "it is what I came for." Kincaid led the way, I followed and "Jeff" held the ladder, at the top of

which we found a narrow passage inclining upward at an angle of thirty or forty degrees, smooth, slippery with the constant dripping of water and with precarious foot and hand-holds. Laboriously we worked our way upward through this dark, silent passage lighted only by the feeble rays of the candles we carried, until we estimated our distance to be one hundred feet above the foot of the ladder. Here we found one of the most wonderful spectacles in the whole labyrinth. A circular chamber, not more than twenty feet in diameter and, according to Kincaid's statement two hundred feet high. Our candles were not sufficient to reveal the top, and every foot of its inner walls were decorated as far as the eye could penetrate, with clusters of crystalized carbonates, snow white and resembling, more than anything else that I can think of, great white swans two or three feet across the back, wings drooping, every feather distinct, standing out as if in upward flight, one preceding another until the view is lost in the darkness; or a flock of angels that had been arrested in their flight and changed to marble. Water was everywhere dripping and glistened like diamonds at the point of every feather.

I am not superstitious but confess to a queer sensation. everything was so unusual; two miles under a vast mountain; more than a thousand feet of earth and rock above us; in this narrow circular chamber, so high that the ceiling could not be seen; reminded of angels by the pure white, wonderful architecture and stillness, where perhaps a million years of darkness has held undisputed sway and no sound, save the soft drip, drip, drip of water, the unseen and almost noiseless architect and builder of these inimitable Marble Halls. In the thought of that time in the vastness of long ago, when these deposits of lime were being formed on the bed of the ocean, where the denizens of the deep once played, forms of life long extinct and of that time since when these great mountains have risen above the surface of the ocean and continents and islands have been made and lost, one may easily forget himself in speculative imagination. One wonders if at the source of the heavily charged waters that now issue from the Mammoth Hot Springs of the Yellowstone there are caverns like these; whether the water here was ever hot like that. and whether the temperature and steam that filled this honey-combed, marble mountain arose in clouds from holes and fractures in its sides.

Returning to our companions in "Solomon's Temple" we climbed back into the corridor, and turning to the left

for a hundred feet or so, entered another chute. Ascending at an angle of twenty or thirty degrees through a circuitous, tortuous passage for about sixty feet, we came into "Jefferson Myers' room", which is about one hundred and fifty feet long and from ten to forty feet wide and of varying height. At the furtherest point this chamber narrows to dimensions which prevent further progress, but does not entirely close and doubtless opens into other chambers. In this chamber are splendid decorations, stalagmite, stalactites, marble basins lined with crystals of the greatest delicacy and filled with water, so pure and clear that touch is necessary to detect its presence. Here some of the sweetest tones are produced by tapping these snow-white pendants with a piece of metal. At the side of this chamber is an opening large enough to drive a horse through, connecting with "Solomon's Temple" and about sixty feet above its floor. If one were to stumble out of this opening in the dark he would have a sheer drop of sixty feet.

We spent the larger part of four days in our explorations and are assured that there are many miles of passages. corridors and chambers that have never been entered. By enlarging passages, as many of those examined by us have been enlarged, glories in lime will be opened and explored. From the bottom of the deepest chamber to the top of the highest visited by us, is almost seven hundred feet and between these points the mountain is honeycombed with innumerable chambers, as I believe, only a fragment of which have ever been witnessed by human eyes. There is no sign of life to be found in these caverns and no fossils, unless an examination of the clay and gravel mentioned shall disclose them. That they are much more extensive than can at present be determined, is shown by the fact that numerous openings in the side of the mountain further down the canyon discharge volumes of water from marble cliffs. Again at every turn in our explorations we saw openings leading away into the darkness, too small to enter, but which we judged opened to wider passages and large chambers. These caverns are within a government forest reserve and fortunately can be protected from vandalism. We caused the attention of the authorities to be directed to them and have some assurance that they will not be only retained by the government, but that a forest ranger shall be stationed there who shall act as guide and protect these decorations from breakage and from the smoke of torches. This spot ought to be made a National Park like Crater

Lake and at least a township of the splendid forest that surrounds them should forever be preserved from civilized savagery and greed. The surroundings are wonderfully romantic and grand. Mountains, forests, canyons and cliffs are gigantic. Geologically it is one of the oldest formations on the continent and shows extreme metamorphism. It is true that all of this limestone has not become marble, but much of it has and of a fine quality and beautifully variegated.

Our last thirty-six hours at the caves was during a continuous downpour of rain. We had prepared a shack from some boards, the remnants of "Captain" Smith's operations and managed to keep partly dry, but not without an experience to be remembered. A party of men and women came just before we were ready to start away. They had been caught on Meadows mountain and had camped out in the rain and came to our camp about nine o'clock in the morning, wet and hungry. We prepared some breakfast for them and after drying them by the fire, accompanied them through part of the caverns. Our horses had gotten away from us and about three o'clock in the afternoon, the rain still pouring, Nickerson, Myers, the Poet and I started down the mountain to the settlements on Sucker Creek, six or seven miles away. The trail was overgrown with brush and choked with fallen logs. About six o'clock we reached a miner's cabin where we left the Poet to enjoy the hospitality of one of these noblemen of the wilds—a Mr. Barrett—and we went on two miles further and found splendid accommodations. The next morning we sent a horse for the Poet and telephoned to Kerbyville for a team. The distance from Kerby was thirteen miles. By two o'clock we drove into that little burg as chipper as larks. The Poet could not say enough in praise of his host of the night, and certainly no weary and bedragged wayfarers ever found more hospitality than was given us by Mr. Grimmet and his wife, with whom we stayed. That good lady even fitted us out with dry clothes and had ours hung about the stove to be dried for our departure next day. Our approach had been heralded about Kerby and nearly the whole town was out to greet us. The expedition was in every way a success and at seven o'clock that evening we reached Grants Pass, tired but happy.

Chapter XVI.

A REVIEW AND CONCLUSION.

We have at some length viewed more than ten thousand square miles of territory of Southwestern Oregon from its mountain tops and in its valleys. We have overlooked as much more of Northern California, and have identified mountain peaks more than a hundred miles distant. That portion of the Old Island within the limits of California is in many respects identical with its territory in Oregon, while in other respects, dependent on climate, is entirely different. The territory with which we have had especially to do is bounded on the north by the Calipooia mountains, on the east by the Cascades, on the south by the State of California and on the west by the Pacific ocean. It has therefore all the varieties of climate that are embraced between the sea level and an altitude of almost ten thousand feet. In its valleys strawberries ripen until Thanksgiving, and its roses bloom until Christmas and sometimes later, while at its highest points the snows never melt. In its greatest altitudes the flora is akin to that found in Arctic regions, while in the valleys some species of semi-tropical vegetation thrive fairly well. From many points of vantage we have been able to read the records from cretaceous times to the present. Within the territory encompassed we have the remarkable fact of single valleys that are now being enriched with the soils of all the periods embraced. From the Cascade Range Rogue River Valley is drawing soils by surface erosion from very recent geological upheavals and deposits, while from the Siskiyous it is drawing by surface erosion soils from a formation so old that its geological designation involves a shadowy uncertainty of the past. On these mountains have grown many species of vegetation that were doubtless extinct before the fossil bearing sandstone of the old shore line was laid down, the fossils of which are of life also long since extinct. On this Old Island we find trees still flourishing that so far as I have been able to learn grow nowhere else. From its high mountains we traced the gold and other metals that have enriched its shoreline. In the magnetic sands along the present sea beach platinum is found and in other places inland on the Old Island this valuable product promises

to become a resource. We have found its valleys wonderfully productive of a great variety of fruits and vegetables; a country that in grapes vies with California and France and in peaches, pears and apples challenges the world. Its mountains are wonderfully rich in the precious and valuable metals and minerals. We have seen that its forests have a world wide reputation, and in their depths is found a sanatorium free to rich and poor alike. Certainly he who has been fortunate enough to secure a home here has much to be thankful for. Always in sight of the diversified attractions of the mountains and where the water is both pure and musical, the climate salubrious and fruit and flowers abundant, he who could not be satisfied would be hard indeed to please. With all the possibilities of that appreciation of the aesthetic in nature which greatly enhances a safe foundation on which to build health and happiness in that respite it furnishes to the one grown weary with other things.

Thirty-five years experience in the Siskiyou mountains has taught me the psychological value of high altitude, silence, dense forests and pure water, with the thoughts and associations that can be had under such conditions. When sick or tired with business cares or public strife I turn toward the Siskiyous and delve into their beckoning haunts. I find in the depths of the canyon and forest a quiet peace. On a mossy bank beneath an yew tree's shade, beside a foaming mountain torrent, I stretch myself alone with Nature.

How cool and still it is and withal so joyously rollicking and noisily delightful. The stream leaps and laughs and plunges in the shadow of the gorge and overhanging branches, where grows the tiger lily, the dog-wood, the maple, the quaking-asp with its leaves a-quiver, maiden-hair ferns clinging to niches in the granite walls, vines clambering over boulders, squirrels chattering and scolding and where the sun in lace-like films, sifts and filters through dense foliage, filling my retreat with a sheen of subdued sunlight, modified and tinted with the greenery that half shuts out the sense of day.

With pipe of love and lovers reed
My muse comes to me singing,
And planted round with goodly seed
The hills with joy are ringing.

In such a place what dreams may come? Here is music too. All chords may be heard in the restless stream from the softest touch to the deepest bass. The gentle lullaby tuned to the music the pine-tops make when stirred by a summer zephyr, mingle with sunshine and shadow, until sound, color and the odor of flowers and blossoms blend into one harmonious whole, so delightfully conceived as to suggest a solemn cathedral, its altars and incense and drowsy Nature as a worshiper.

Bubbles break on the foaming stream
And scatter sifted pleasures,
Throughout the realm of this fair dream,
This mystic realm of magic treasures.

But I'm up and on again through the forest and glade, climbing higher and higher still, filled with the spirit of the mountain; up into God's brightest sunlight and purest breezes.

From everywhere comes to me a welcome borne on Nature's breath, sweetened with the odor of the woods, enlivened with the winging whirr of the bee, the flutter of pheasant and quail. And now I'm startled and stopped in my wild wood scurry by the cracking of brush, and behold! as if in kingly consciousness of form and grace, a sturdy buck with spreading antlers; a trim limbed doe at his side. But a moment they delight my eyes, then sounding his pipe of warning, they bound away; the forest closes about their receding forms and I see them no more.

On, still I clamber, only halting now and then for breath or to view the prospect from some commanding point, or to drink in the glorious majesty of the forest. Stately pines and firs cheer me with their shade and spread their cast-off foliage, a soft carpet for my feet. All Nature seems in a social mood and though alone I'm blessed with the best of company. I stop and chat with a giant pine of mighty girth and imposing height. The soft breezes stir his branches and through his luxurious foliage he sings to me a gentle song of welcome. I drop myself on the soft bed he has spread for me, and turning my face upward listen to his story of two thousand years of life. He tells me he was a husky sappling a hundred years old when our Savior was on earth. He watched the flame and smoke, heard the thunderous sounds and felt the earth beneath him shake when Vulcan lit his torch on Shasta and McLaughlin, that now look so beautiful, and white, and still

in their mantles of snow. He tells me that he was a giant of the forest before any of the present nations of earth had grown great. He had commenced to grow old before Columbus discovered America, and had watched many generations of wild men come and go before civilization came to this hemisphere. He had long trembled in fear of the woodman's axe, but now blesses the day that made his habitat a forest reserve and hopes he may lay his bones among his ancestors in the orderly way of Nature.

But now I've finished my dream in this generous shade. With a blessing from the monarch, I pursue my journey toward the snowbanks. I follow the pine-clad ridge, looking ever and anon into the depths on either hand, or upward where

> Siskiyous crags are banked with snow,
> On summits grand and lofty,
> And shining peaks where'er I go
> Reflect the sunlight softly.

The winds in the tree tops sing to me gently and the sound of rushing water comes to me from below. Now and then I climbed a nearby cliff overlooking great depths or majestic heights and watch the spots of sunshine and cloud shadows chasing each other in and out, among the giant pines and firs, picturing alternately with light and shade, the hoary heads of these grandest monuments of God. Up and on, again and again, until I stand on the summit of Ashland Butte eight thousand feet above the level of the sea, in a rarified air and the purest sunlight; snow and silence all about me and more than a thousand square miles of mountains and valleys in view. Mountain billow succeeding mountain billow to the horizon's brink in every direction. Shasta and McLaughlin, Union Peak, Mt. Theilson, the great cliffs that form the framework about Crater Lake, and the Three Sisters can all be seen. California and Oregon lie at my feet. Away below me lie Shasta valley in California and Rogue River valley in Oregon, shimmering in the silvery sheen of a summer's heat, indebted for their fertility and beauty to the snow banks at the mountain tops. At the northern foot of this mighty slope nestles the little city of Ashland and beyond it rises Grizzly mountain with its ancient records.

One cannot conceive of the muificence of the bounties of Providence until he has gone into her great storehouse with his soul tuned to the environment. In the depths of these massive piles Nature's hoards of minerals are kept

from hence go leaping and sparkling, the rill, rivulet and river that make the valleys blossom. Here are the forests that supply man's multitudinous wants in commerce and trade. Here is a sanatorium for the sick and God's great paradox, an oratorio in silence.

Here from this lofty summit I view a wonderful panorama. To me comes a feeling of reverence and peace and the "small still voice" thrills me. Here is a great entertainment where the earth, the air and sky are the stage settings, the clouds are the curtains and the music of stillness a divine revelation. My sensibilities are all awake, yet my inner consciousness is bathed in a subtle something which seems to be independent of the senses and I am reminded of John Fisk's book, "Through Nature to God." My muse again whispers reverently,

To know of God, draw near to Nature,
Her truths are the keys to every soul.
To see in Nature's every feature,
Love's limpid, laughing, flowing bowl,
Is but to feel that God still liveth
And all around are parts of Him.
To him that loves, the Master giveth.
A bowl that's filled beyond the brim.

In these deep solitudes the spirit of the mountain is ever about us. It whispers in the blue sky, scintillates and sparkles in the witcheries of the night; it calls from the depths of the forest; gurgles and sings in the laughing waters; it thunders from the heights and ever invites imagination to wander in subterranean caverns, and to tell of the things it sees and hears.

Again I return to the monarch pine and stretch my weary frame for delicious repose. As I lie listlessly beneath the generous shade and give myself unreservedly to the subtle influences that environ me, I seem to become a part of the all-pervading spirit of these solitudes. By gentle degrees the hamperings of my human self are loosened and fall away; the gentle movements about me become music; the odors become incense; crags and peaks, forests and slopes, become works of art finer than human hands can draw and the movement of running water is the motion and murmur of a countless throng which is at once many and one. As my body lies thus stripped of the animation that at other times dominates it, and the soul released floats into its realm of mystery, there come visions to me

down the aeons of ages I seem to have traveled, and an indefinable acceptance of a fact which is neither memory nor me, but of which I am at once a part and the whole. The laws of the material universe no longer bind me. I float or fly without fear or surprise. The early dawn of consciousness in the world seems to be a present song, and all intelligence of things without the sense of will seems mine. Where man dreams of that elusive something he calls ether I am illumined by it; thrilled and carried aloft with it. I delve below the ocean like a bird that flies through the air, or without thought of harm walk upon the surface of the waters. I have no need to measure time, it is all now. The past and the future are one and that one the present. All space is an intelligible here. I have no need of stimuli to cortical centers, for all knowledge seems mine without the excitement of nerves or the awakening of senses.

"O, when I am safe in my sylvan home,
I tread on the pride of Greece and Rome;
And when I am stretched beneath the pines.
When the evening star so holy shines.
I laugh at the lore and pride of man,
At the sophists school, and the learned clan;
For what are they all, in their high conceit,
When man in the bush with God may meet?"

(The End.)